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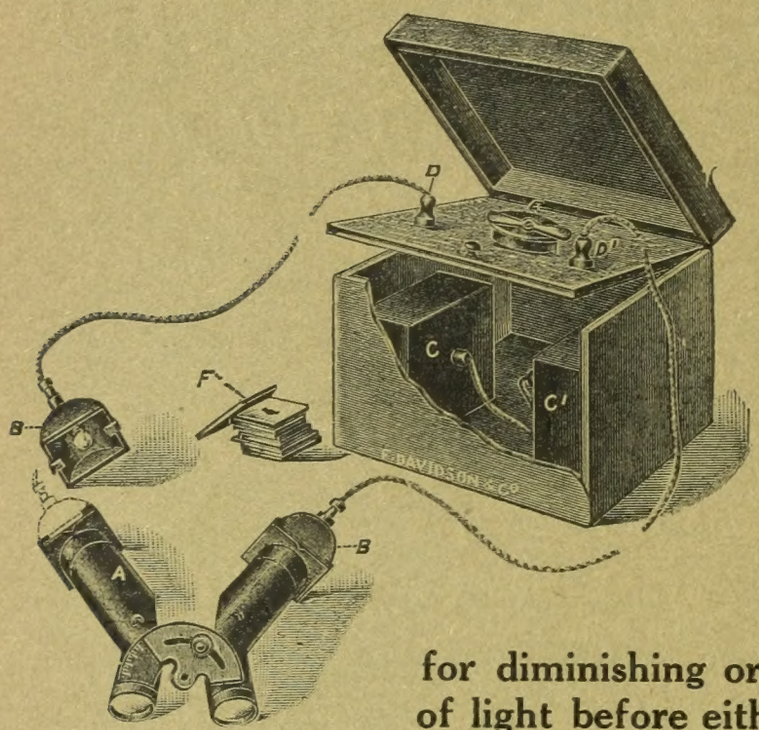

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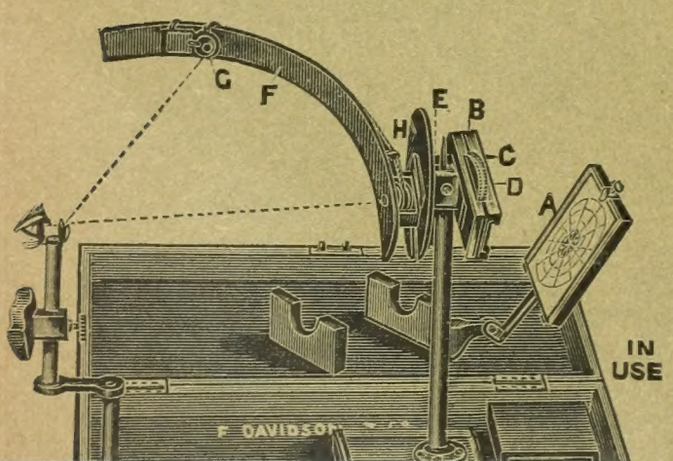

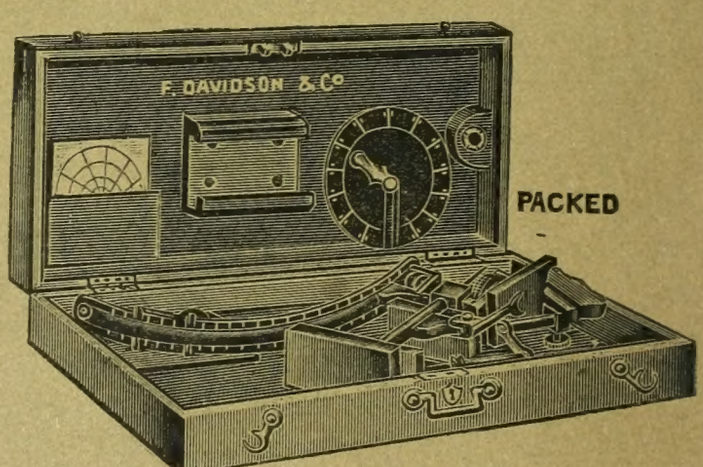

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ORIGINAL COMMUNICATIONS.

METASTATIC GONORRHŒAL CONJUNCTIVITIS: DEMONSTRATION OF THE GONOCOCCUS IN SMEAR AND CULTURE.*

BY

HANFORD MCKEE, B.A., M.D.

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(From the Pathological Laboratory of the Montreal General Hospital.)

Introduction.

WE recognise to-day two distinct forms of gonorrhœal infection of the conjunctiva: (1) gonorrhœal ophthalmia, due to the direct transfer of virulent pus to the conjunctiva; (2) metastatic gonorrhœal conjunctivitis, a form which occurs in subjects with systemic gonorrhœa, and which is due to infection carried to the eye by some internal means.

The course and results of gonorrhœal ophthalmia in infants and adults are only too well-known. Bacteriology has placed our knowledge of its cause on a sound basis, thanks to the work of Neisser and Piringer.

The second type has been known for many years; in fact, metastatic was the first of these forms to be recognised, and at one time, all cases of gonorrhœal conjunctivitis were attributed to infection by metastasis. It has a characteristic clinical appearance. Early in the course of a gonorrhœa, or after some months, or during a relapse, the patient suddenly finds both eyes inflamed, with more or less muco-purulent discharge. Shortly after this, gonorrhœal rheumatism makes its appearance.

The inflammation occurs among males; tends to recur; and may remain a conjunctivitis, or may involve other parts of the eye.

While metastatic conjunctivitis has been well understood clinically, its ætiology has been the subject of much speculation and discussion. Bacteriological work has been practised to a very limited degree, and in the great majority of cases has consisted simply in the examination of a prepared smear. Many of these cases, too, were reported before we were acquainted with the pathogenic conjunctival organisms and before conjunctival bacteriology had been brought to its present standard. As was to be expected, the results were largely negative—to such an extent, in fact, that the presence or absence of the gonococcus has been taken as the important point in the differential diagnosis of the metastatic from the form due to direct infection.

If not due to the gonococcus, to what, then, shall we attribute it? According to Carroll, there are three theories. Axenfeld, in discussing van Moll's paper at the Congress in Utrecht in 1899, advanced the theory that this form was not due to the gonococcus, but rather to the action of the gonotoxin on the conjunctival tissue. A second theory is that the inflammation is due to a mixed infection; that the gonococcus, or its toxin, prepares the way for the ordinary pyogenic bacteria, so frequently found in the conjunctiva, to set up an inflammation. The third theory is that the infection is a true metastasis, that the inflammation is set up by the gonococcus, carried by the blood-vessels to the

*Read at the meeting of the American Association of Pathologists and Bacteriologists, Boston, April 9th and 10th, 1909.

conjunctiva, as we know, it can be carried to different parts of the body. The evidence in favour of this view consists in the fact that Lipski, Morax, van Moll, Burchardt, Kurka and Knapp, have found the gonococcus in the conjunctival secretion. Whether differentiation from the other Gram-negative diplococci was effected or not in these cases, I am unable to say.

Case.

The diagnosis of metastatic conjunctivitis depends largely upon clinical evidence.—E.B., a young man, aged 18 years, was referred to me by Dr. C. W. Vipond, on Monday night, November 2nd, for treatment for gonorrhœal conjunctivitis. He had been under treatment for some months for gonorrhœa, but in spite of that had spent Thursday night, October 29th, in sexual excess. On Friday his eyes felt peculiar, and he noticed they were blood-shot. During the following two days the redness increased, and on the next evening he came to consultation.

He complained that his eyes were painful, especially the right, although both eyes had become involved simultaneously. There was no swelling of the lids, and but very slight chemosis of the bulbar conjunctiva of the right eye. Intense congestion of both palpebral and bulbar conjunctiva was present, although a ring about the corneo-sclerotic margin was of normal colour and contrasted very markedly with the rest of the conjunctiva. There was a profuse muco-purulent discharge, especially from the right eye. The whole furnished a typical picture of a severe acute catarrhal conjunctivitis of pneumococcus or Koch-Weeks' type. After examining the media, fundi, and vision, which were normal, slides were examined, and media inoculated. His eyes were then washed out with warm boric acid solution. He was given some powdered boric acid to use, and told to return the next day.

When he returned the following morning, there was no appreciable difference in the conjunctivitis, but he complained that upon rising that morning, his left big toe was so swollen and painful he was unable to put his shoe on and had a slipper on his left foot. The next day his foot was so painful that the family physician was called to see him. His diagnosis was gonorrhœal rheumatism, and he advised removal to Hospital, where the patient was admitted to the Ear and Eye Ward, when the following notes were made:

Patient is a well nourished and developed young man, with sallow complexion. There is at present no urethral discharge. He had had a discharge for three months, but with the onset of the inflammation in his eyes, this had stopped. There is no evidence of a scar on the penis, no pain on micturition, but there is a large quantity of pus in the urine. There is a marked swelling and redness of the metatarso-phalangeal joint of the great toe of the left foot. Great pain on movement of the foot, and marked tenderness over the joint. The other joints of the body are normal. He has in both eyes a severe catarrhal conjunctivitis. Previous history negative. The treatment ordered was irrigation of the conjunctival sac with warm boric solution, with local applications to the painful joint.

November 5th.—Eyes show marked improvement. The conjunctival congestion is much less as is the discharge. He spent a restless night. The pain in the great toe was very severe, and to-day he complains of pain in the left ankle and left temporo-maxillary joints.

November 6th.—Eyes continue to improve. The great toe of the left foot is not so painful, but both temporo-maxillary joints are involved, and the right knee joint swollen and very painful.

November 7th.—Patient had a restless night. T. 103°F. Bulbar conjunctivæ normal, palpebral shows some congestion, but is practically normal. Patient was transferred to-day to the medical ward—*i.e.* four days after beginning treatment, which consisted only of washing the eyes with boric solution, and eight days after the eye symptoms began, his conjunctivæ were in a normal condition.

November 8th.—Eyes normal.

November 10th.—Eyes normal. Left knee painful.

November 14th.—Right and left knee very painful. T. 103°F. Conjunctivitis present again in the right eye.

November 15th.—Eye better.

November 16th.—Knees very painful. Urethral discharge to-day from which the gonococcus was obtained.

November 19th.—Left the Hospital.

The patient was seen at his home at intervals up to December 10th. Up to this time his eyes had remained quiet and his rheumatism had been steadily improving. On December 10th however, his knees and elbows became freshly involved. His eyes became "like balls of fire," and there was again some discharge. The conjunctivitis continued three or four days, but as the rheumatism made no improvement, he was sent again into Hospital, December 15th.

Since that date his eyes have received no treatment, and have remained well. The patient was seen January 3rd, and, again, at a later date in January. His eyes had remained well, and his rheumatism had progressed satisfactorily.

The diagnosis of metastatic conjunctivitis was made from: (1) the onset and course of the inflammation; (2) the absence of clinical signs of exogenous infection; (3) the coincidence of the conjunctivitis with other systemic gonorrhœal manifestations; and (4) the bacteriological report.

Bacteriology.

When the patient was first seen, one slide after another was prepared and examined, until, in one, three Gram-negative diplococci were seen, either within or upon three leucocytes. Eighteen slides had been carefully prepared and searched through before this result was obtained. Tubes of plain agar, blood-serum, hæmoglobin- and hydrocele-agar were then inoculated. After 20 hours in the incubator, they were examined. No growth was perceptible. Twenty-four hours later, they were examined again. In the tube of hæmoglobin-agar a profuse growth was seen. The surface was thickly dotted with small raised colonies of whitish colour, which, upon examination, were seen to be the bacillus Xerosis. In the midst of this growth two colonies of different appearance were seen. They were larger, moist-looking, and colourless. Upon examination, these were found to be Gram-negative diplococci. These two moist colonies, with the surrounding growth necessary, were then transferred to other tubes of hæmoglobin-agar. From day to day the growth of the Gram-negative diplococcus increased, so that, at the end of seven days, we had a profuse mixed growth of the Gram-negative diplococcus and the bacillus Xerosis. They were then easily obtained in pure culture. Blood cultures were taken upon two occasions. The first was negative. The second, taken at a time when the systemic infection was marked by severe pain and high temperature, gave us, after 48 hours, tiny points over the hæmoglobin-agar. These were found, upon examination, to be Gram-negative diplococci, which, however, we were unable to transfer.

The Gram-negative diplococcus obtained from the conjunctival secretion was compared with a micrococcus catarrhalis obtained from the nose, a

meningococcus from the cerebro-spinal fluid, and a gonococcus from the urethra. It grew only at the body temperature, and not at all on plain agar, gelatine, blood serum, bouillon, or milk. Grew well on hæmoglobin-agar, with typical appearance. It fermented dextrose. In morphology, cultural features, and sugar reaction, therefore, this diplococcus was differentiated from the meningococcus, the micrococcus catarrhalis, and saprophytic Gram-negative diplococci.

The micrococcus catarrhalis and other Gram-negative diplococci are frequently found on the normal and inflamed conjunctiva. This makes differentiation necessary. The Gram-negative diplococci found on the conjunctiva in purulent ophthalmia are not always gonococci, nor are those on the conjunctiva in meningitis cases always meningococci. Every case of catarrhal conjunctivitis in a patient with systemic gonorrhœa is not metastatic. Careful bacteriological examination is necessary, and where Gram-negative diplococci are found, careful differentation is essential.

Pathology.

A snipping was taken from the palpebral conjunctiva, fixed in Zenker, and cut in paraffin. Examination of the tissue showed the following.—The epithelium is studded with polymorphonuclear leucocytes. The sub-epithelial tissue shows œdema of the vessels, some peri-vascular infiltration, with lymphoid and plasma cells. The lymphatics are dilated. Immediately beneath the epithelium, the vessels are engorged, and contain numbers of polymorphonuclear leucocytes, which can be traced in an unbroken path to the epithelium. The presence of this large number of polynuclears in the blood-vessels may be of some significance, since it is believed the gonococci in metastasis are carried as emboli to the seat of the inflammation.

A search through a series of sections specially stained for micro-organisms gave negative results. Kurka, who examined tissue from a case, was also unable to find pathogenic organisms. During the last three years I have examined a great many conjunctival sections for organisms. Snippings from cases due to the Morax-Axenfeld diplo-bacillus, the pneumococcus, bacillus influenzæ, and other organisms were taken, where in the secretion, these were found in large numbers. Often a search for them in the tissue proved negative. Under such circumstances, it is not surprising that search for the gonococcus in the tissue in metastatic conjunctivitis has upon these two occasions given negative results.

But it may be asked, why, with gonococci in the conjunctival sac, was there such a mild clinical course? Stock has shown that organisms causing a metastatic inflammation produce a much milder form than when introduced in some other way. Again, if gonococci were present in smear and culture, why call the conjunctivitis metastatic? The clinical history and course answer this. The ectogenous type of gonorrhœal ophthalmia varies considerably in severity. The virulence of the urethral infection may have been attenuated before the eye became inoculated. Mild cases undoubtedly occur, but it is to be remembered that some of these mild infections are due not to the gonococcus, but to the micrococcus catarrhalis and other causes.

Conclusion.

The interesting points in this case, which gives us a typical picture of a metastatic conjunctivitis in gonorrhœa, are as follows.—The retropulsion of the old writers was very definite; although urethral discharge had been present from three to four months, with the onset of the eye symptoms the discharge stopped. Subjective symptoms were present from three to four days. The

onset of the conjunctivitis was indefinite, and simultaneous in both eyes, following sexual excess. The previous history of the patient was good, and, in particular, there was no rheumatism. The clinical picture and the course of the conjunctivitis, almost without treatment, were mild as compared with the exogenous type. The tendency of the conjunctivitis was to recur, and to remain a conjunctivitis, as it does in 65 per cent. of the cases. The rheumatism occurred shortly after the conjunctivitis, and ran a typical course. Our interest, however, in the present case centres around the bacteriological report. As has been stated, some writers give the absence of the gonococcus from the secretion as an important point in differential diagnosis, and attribute the metastatic inflammation to a toxin. More likely, the gonococci were present, but owing to faulty methods, were not found. The organisms must necessarily be few in number, and a bacteriological report from the examination of one or two slides shows one how easily error may creep in. In this case eighteen slides were examined before any definite result was obtained.

That I was able to cultivate the gonococcus I attribute to having seen the case in its early stage, and to having used media upon which the gonococcus would grow as profusely as would the contaminator. That I obtained it in pure culture was due to frequent transplanting for days when I really felt the task hopeless.

Axenfeld says, "Morax, in his exact bacteriological research, stated that scattered gonococci may be found in such cases; Parinaud made the same observation, and their results were confirmed by van Moll. We must not, therefore, conclude from a negative examination for gonococci that the inflammation is due to a pure toxin metastasis, and not metastasis of the organisms themselves, though the former cannot definitely be excluded. Certain proof, however, is not yet available."

We believe that the present case makes proof available that metastatic conjunctivitis is not due to a mixed infection, that it is not caused alone by the gonotoxin, but that it represents a true metastasis of the gonococcus.

RETROBULBAR NEURITIS SIMULATING HYSTERIA.

BY

WENDELL REBER, M.D.,

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THE ordinary type of retrobulbar neuritis presents little difficulty in the way of diagnosis. Occasionally, however, there are complicating features that throw considerable confusion into the diagnosis—such, for instance, as hysteria. The writer has recently been confronted with this particular difficulty, and found sufficient interest in the developments of the case to impel him to put it on record. The facts are as follows:—

X. Y. L., a dental surgeon, first came under the writer's notice in 1897. At that time he was treated for an infected corneal ulcer, resulting from the sudden impact against the cornea of an old gold filling that he was trying to pry out of a patient's tooth. This ulcer occurred in the left eye. For six days the integrity of the eyeball was threatened, but, finally, the infection was controlled and he issued from the combat with a 2mm. eccentric thin corneal scar and vision of $\frac{2}{3}$—a most happy result. During this treatment, it was learned that for three or four years previously he had been living to the flesh with all his might and main, so that when active inflammation of the eye had ceased, he followed a course of iodide for some months, reluctantly however. He drifted out from under my observation for six years, and then appeared

in 1903 complaining of a slight blur before the left eye, accompanied with some phosphenes and a suggestion of violet vision at times. There was also some slight pain when the eyeball was rotated into any extreme position from the primary position, but no retro-ocular pain. Vision at this time was $\frac{5}{12}$ as against the previous $\frac{2}{3}$. The eye was normal anteriorly, the tension normal, and the eyeground revealed no anomaly other than a rather suspicious congestion of the nerve-head. There was no blurring of the disc edges, no striation, and no disturbance in the blood-vessels. The visual field also showed no abnormality.

The right eye was normal in every respect. Attention is directed to this fact as this is the eye that later gave rise to the complication referred to in the title of the paper.

Inasmuch as the patient had been having quite a heavy head-cold, he was referred to a rhinologist, who after thorough-going search of his upper air tract, stated that he had no sinus disease whatever. The urinalysis also was negative. The patient was therefore directed to take a Turkish bath

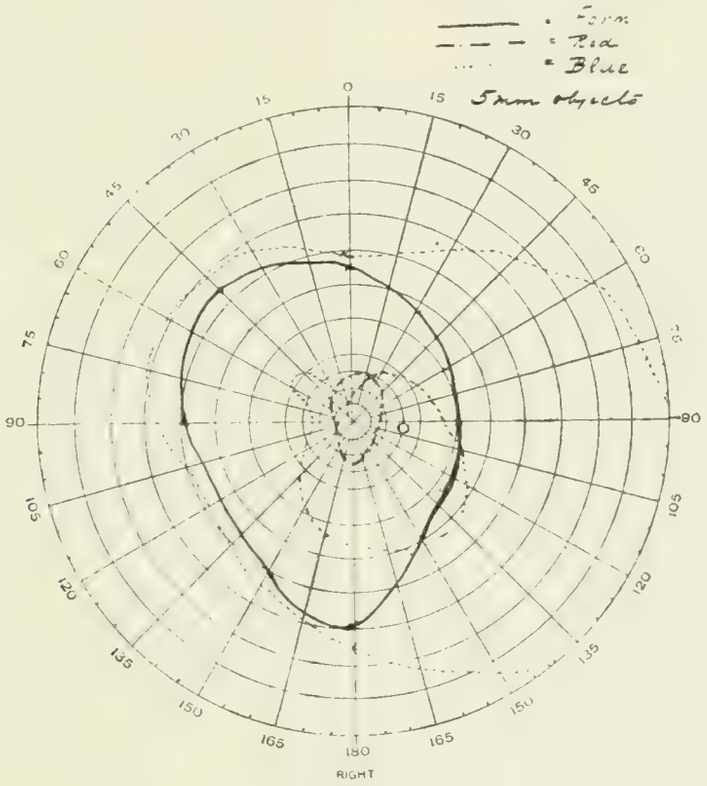


Fig. 1.

daily, and because of his previous history, he was immediately placed on 1/16 of mercury biniodide three times a day. He was watched from day to day, and ten days later there was plainly manifest slight swelling of the disc edges, the nasal edge being almost entirely obscured. The veins were quite dark and tortuous. Estimate showed the nasal edge of the disc to be swollen about $1\frac{1}{2}$ diopters. The visual field, charted at this visit, revealed a small central relative scotoma for the 5 mm. red object, and extending 5 degrees on the nasal and about 10 degrees to the temporal side of the fixation point. Three days later the whole nerve-head was swollen about 3 diopters, and a very small linear hæmorrhage in the nerve-fibre layer of the retina had appeared to the temporal side of the disc. The area of œdema and exudate about the disc reached out about one disc diameter all round the nerve-head. At this juncture he was seen by one of my colleagues, who insisted that, because of the hæmorrhage, everything

pointed to renal disease, and that repeated urinalyses would show the renal origin of the optic neuritis. Six different exhaustive urinalyses, at intervals of three days, all proved negative, and this conception of the condition was then abandoned. Meanwhile, under the Turkish baths and vigorous use of the mercury, the optic neuritis had begun to subside, and eventually the patient recovered, with an astonishingly good-looking nerve-head and vision of 2/3 eccentrically. There remained, permanently, a small central relative scotoma for red. For the best part of a year after this the patient faithfully followed a course of iodide.

Soon after the patient married a wife, and for three or four years all went well. Then began small family differences, which gradually went from bad to worse, until the last year could be described only as one of chronic domestic infelicity, with acute exacerbations. A by-product of this *dénouement* was an extreme hyperæsthesia on the part of the patient, whom I had always considered a rather phlegmatic person.

This brings us to the present history of the case, which dates back about three months. At that time he returned to me saying, that for two or three weeks his right eye (which had always been the sound one) felt painful when it was moved in any direction. He also complained of low-grade photophobia, and occasional phosphenes, adding that the sensations were just such as those which had preceded the neuritis in his other eye. This was on February 16th, 1909. The vision in the right eye this day was 2/3 of normal. The anterior ocular segment was normal save for a little injection of the deep ciliary vessels. There was no ciliary tenderness, and the tension was right. The media were clear, and there was no eye-ground anomaly other than the very low-grade hyperæmia of the optic nerve-head frequently seen in the eyes of those who use their eyes much for near work. The skin of the lids on the right side was anæsthetic, likewise the conjunctiva above and below the cornea. The latter membrane was much reduced in sensibility. The same was true of the left eye, save that the cornea was of normal sensibility. There was also hyperæsthesia in the forearms over the ulnar aspect and over the little finger and outer aspect of the adjoining finger corresponding to the area of disturbance of the ulnar nerve.

The report of the urinanalyst and the rhinologist were again both negative. Three days later the vision had declined to 5/12, and still there was no essential change in the nerve-head. The visual field charted this day is shown in Fig 1. The unequally contracted form field along with the inversion of the red and blue fields associated with the areas of ocular and other anæsthesia, made the diagnosis of hysteria extremely probable, the more so as the condition of the right optic nerve remained practically normal. There was no central scotoma of the right eye. He was referred to an internist who went over him searchingly, and found as the only abnormality a systolic blood-pressure of but 105 mm., after repeated readings. He reported that he was obliged to concur, for the time at least, in the tentative diagnosis of hysteria.

The patient was studied from day to day, however (because of the previous retro-ocular neuritis that had developed much more suddenly in the left eye six years previously), and five days after the taking of the visual field above mentioned, the nerve-head for the first time showed unmistakable slight inflammation with some swelling of the nerve-fibres, moderate haziness of the disc edges, and highly engorged lymph sheaths and veins. The pupil was 6 mm. in size and reacted but 1 mm. The patient was immediately sent to the hospital for daily sweating with pilocarpin (hypodermatically) and mercurial inunctions. This was February 25th. Vision 5/30.

February 28th V.=5/30, nerve-head badly inflamed, swollen about 2 diopters, veins very broad, dark, and exceedingly tortuous, lymph sheaths lost in the general inflammation, and to the lower nasal side of the nerve were two tiny linear retinal hæmorrhages in the fibre layer of the retina, just like the one that had appeared in the left eye during its attack. The visual field of this day revealed practically an absolute central scotoma for 5 mm. white object and an absolute scotoma for the 5 mm. red object about twice the size of the white one. The diagnosis of hysteria now gave way completely to that of retrobulbar neuritis, probably of specific origin.

On March 15th, after three weeks of the pilocarpin sweating treatment, his vision was 5/15, and the condition of the nerve-head somewhat improved. On March 17th, vision=5/12 plus, and the swelling of the nerve-head had almost disappeared. On March 20th the vision had risen to 5/6, and on March 25th it had reached the full normal of 5/5. On this date the visual field had returned to normal limits for form and colour, and no scotoma whatever for even a 3 mm. red object was to be found. The nerve-head was very little filled in with exudate, was finely outlined, and of surprisingly good hue.

To-day, April 15th, one would easily be led into saying that there had never been anything the matter with the nerve-head, for it presents a normal aspect in every respect. For the past month he has had 1/20 strychnia nitrate three times daily, 60 grs. iodide daily, and two Turkish baths weekly. This will be continued for almost two months longer.

Cases of this type are reported from time to time in the literature, all pointing to the extreme difficulty in arriving sometimes at a true diagnosis. Had the patient here referred to not had retro-ocular neuritis 6 years previously in the fellow eye, the writer fears he would have been led entirely astray until the negative ophthalmoscopic signs gave way to the tell-tale changes in the optic nerve-head. Moreover, the blindness, which in retro-ocular neuritis usually begins as an obstruction of vision in the centre of the field and progresses in from 2 to 10 days to complete, or nearly complete, blindness, was not at all a well-defined phenomenon in this case, probably because of the prompt institution of vigorous eliminative treatment. There is much to commend the suggestion of Bergmann (*Zeitschrift f. Augenheilkunde*, Bd. V., 1901) that just as retrobulbar neuritis may depend upon some primary disturbance of metabolism, so also may hysteria, the unknown toxin working, on the one hand, on the optic nerve, and on the other, on the brain.

CLINICAL AND BACTERIOLOGICAL MEMORANDA.

A SIMPLE SUBSTITUTE FOR A ROTATING PRISM.

BY

HAROLD GRIMSDALE, M.B., F.R.C.S.

OPHTHALMIC SURGEON TO ST. GEORGE'S HOSPITAL, LONDON, ETC.

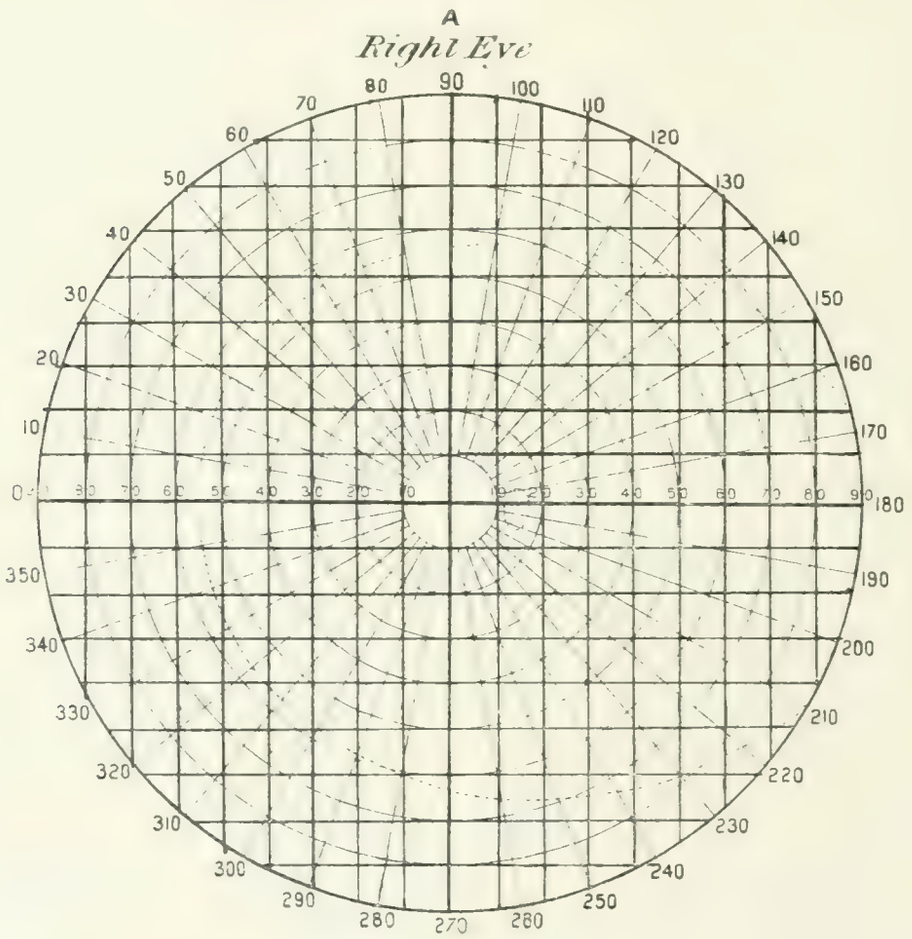
The measurement of muscular deviations (heterophoria), by the use of a number of prisms, inserted one after the other in a test frame, is by no means satisfactory. The intervals between the adjustment of the various lenses allow the eyes to resume their faulty position, and thus make a true estimation even more difficult than it would otherwise be.

The use of two equal prisms, superimposed and rotating in opposite directions, so that movement of the image takes place only in the required sense, gives the best possible result, but the apparatus is heavy and unwieldy, so that it cannot be worn in a trial frame.

Recently the following device suggested itself to me as a simple substitute, which can be utilised without any expense.

A perimeter chart is taken, and, as in the diagram, vertical and horizontal lines are ruled through the points where the concentric circles cut the horizontal and vertical meridians. Each 10° interval of the visual field represents the deviation of any unit prism, in my own practice 1°.

When Maddox's rod shows any lateral deviation[4] the Maddox's rod must be placed in the posterior cell of a trial frame, and a 9° prism placed in front of it with the base down. The 9° prism is chosen because there are nine concentric circles on the chart.



As the prism is rotated, the vertical line moves either to the right or left, according as the prism is rotated to the right or left, and any point in it may be imagined to travel round the circumference of the outermost circle, until, when the prism has rotated through a right angle, the lateral prismatic effect is 9°, and the vertical effect has become nothing. The chart allows us to find by inspection the varying vertical and lateral deviations during the movement of the prism. For example, if after rotating the prism to 120°, the lateral deviation is corrected, and the line seen by the Maddox's rod lies over the point of light, we see by inspection of the chart that the point 120° lies midway between the vertical lines cutting the outer circle, and drawn through the points 40 and 50 on the horizontal line. This shows that the lateral effect of the 9° prism, rotated to 120, is 4.5° prism base in.

Similarly, if there be a vertical deviation the Maddox's rod is placed with rods vertical and the 9° prism with the base in.

The chart also shows, graphically, how we may correct a lateral and a horizontal deviation by a single prism.

Suppose, for example, that our tests have shown us an exophoria of 7°, and a hyperphoria of 4° prism. Now trace the vertical line running through the point marked 70 upwards; note where it crosses the 4th horizontal line. This almost corresponds with a point on the circumference of the 80 circle at 150°. A hyperphoria of 4° prism and an exophoria of 7° prism will be corrected by a prism of 8° placed with the base, "down and in," at 150°.

THE BACTERIOLOGY OF BLEPHARITIS ULCEROSA.

BY

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A GLANCE at Axenfeld's *Bacteriology of the Eye* (MacNab's translation, 1908, p. 56) will show that many investigations have been made into the bacteriology of blepharitis ulcerosa. Staphylococcus pyogenes aureus has been the organism usually met with. Other less common microbes are the staphylococcus pyogenes albus (Cuénod, Herzog), diplococcus albicans (Herzog), and in cases which originate from chronic conjunctivitis, the diplo-bacillus of Morax-Axenfeld.

Such, then, is the accepted teaching upon the subject, from which my own experiences do not markedly differ. This being the case, I should have hesitated to publish the results of my bacteriological examination of cases of blepharitis, but for the fact that my friend Mr. Angus MacNab (*Royal London Ophthalmic Hospital Reports*, Volume XVI, part III, p. 314) has stated that the "only constant and . . . . . .almost invariable organism found in these cases is the diplobacillus of Morax and Axenfeld." This is so opposed to what I have seen that I am now induced to place my experiences upon record.

My cases, which numbered fifty (50), were all in young subjects, whose ages ranged from $2\frac{1}{2}$ to 18 years, and averaged (disregarding months) $7\frac{1}{3}$ years. All were affected with blepharitis ulcerosa, generally associated with pronounced pustulation around the roots of the eyelashes. At the moment of examination four of the children suffered, in addition, from phlyctenular conjunctivitis or keratitis.

As material, cilia, epilated from the affected lids, were employed. In eleven of the cases cover-glasses were smeared with the bulbous root of the plucked-out lashes, while in all fifty cases agar slants were inoculated by the same means. It is important to observe that agar was the only culture medium employed in the experiments, which were undertaken, I may add, several years ago.

The results obtained by culture may be tabulated as under :—

Aureus.	Albus.	S.pyogenes	M.citreus	B.coli.	B.xerosis.
39	19	1	1	1	1

To go into the figures a little more closely, it may be said that a pure culture of the s.p. aureus was obtained in 27 cases and of albus in 11 cases, while in 8 cases both micro-organisms were found, sometimes one and sometimes the other preponderating. In 1 case aureus was associated with streptococcus, in 1 with micrococcus citreus, in 1 with a bacillus of the xerosis group, and in 1 with the bacillus coli communis.

With regard to smear preparations, by means of which 11 of the 50 cases were examined in addition to culture, 8 showed nothing beyond Gram-negative cocci and diplococci, subsequently found by culture to be aureus, albus, or citreus, as the case might be. In 2 cases, besides pyococci, the xerosis organism was present. Finally, in 1 case diplo-bacilli, Gram-negative, and morphologically identical with the Morax-Axenfeld organism, were found.

There can be little doubt that one cause of the discrepancy between Mr. Angus MacNab's results and my own, as given above, is to be found in the fact that whereas he employed as culture media Löffler's blood serum and ascites-agar, I used agar alone, a material upon which the Morax-Axenfeld organism develops with difficulty, if at all. At the same time, how can we reconcile the results obtained by the examination of smear preparations? It is curious that amongst 11 of my cases examined in that way diplo-bacilli were found once only, and assuming that proportion to hold good for the remaining 39 cases, the organism in question would occur in 9·09 per cent. of the total number. Yet, according to Mr. MacNab (whose competence as a bacteriologist is unquestioned) the cause of a large proportion of the cases of blepharitis is to be found in the Morax-Axenfeld micro-organism.

SPECULUM FOR EXCISION OF THE OPTIC NERVE.

BY

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IN ocular tumours, such as glioma of the retina, and tumours of the optic nerve, as well as in sympathetic ophthalmias, etc., it is recommended that in case of excision of the globe, the optic nerve should be cut as far back

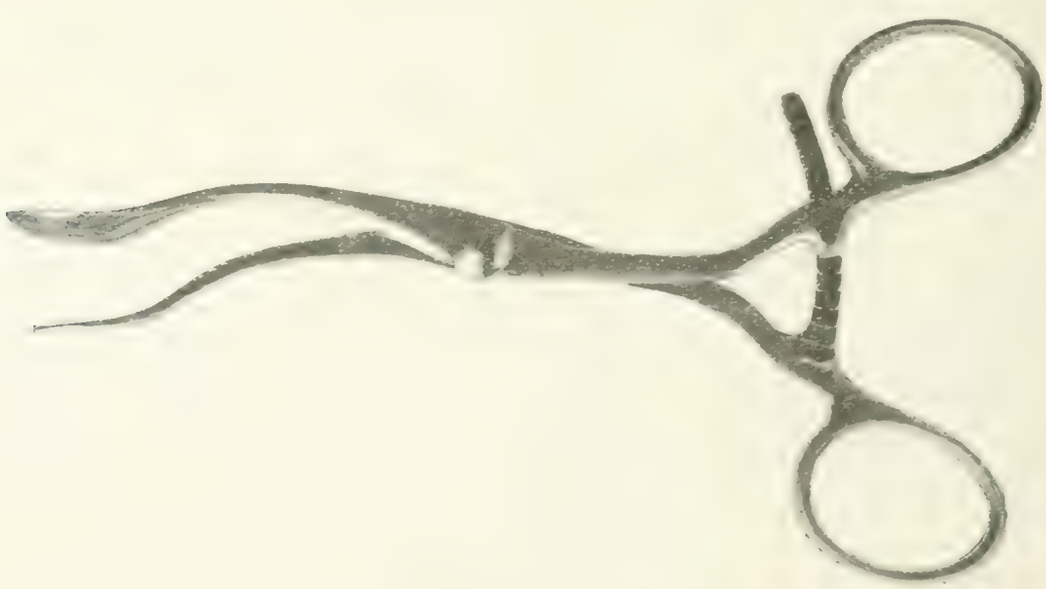

FIG. 1.

The opened instrument.

as possible, since in these diseases the tumours and the inflammation spread through the medium of the optic nerve. As a rule, it is difficult to cut the latter very far back, owing to the tissues which fill the orbit.

Some surgeons use Trelat's spoon for excision of the eyeball. This instrument takes hold of the globe from behind and pushes it forward. But even with it, the optic nerve cannot be cut very long on account of the tissues of the orbit. We have endeavoured to escape this inconvenience by inventing an instrument, which, while causing the globe to spring forward, presses the tissues down in the orbit. Our instrument (fig 1) consists of two blades linked together by an articulation similar to that of Doyen's mouth speculum. One of the blades has at its end a spoon, and the other a hollowed spatula (fig. 2).

Mode of proceeding.—The bulbar conjunctiva having been incised and the recti and oblique muscles divided in the usual way, the surgeon introduces the closed instrument on the external side of the orbit just as he would proceed with Trelat's spoon. Having reached the posterior side of the eyeball, he then opens the instrument, so as to separate the spoon from the spatula. In this

FIG. 2.
The hollow spatula. The spoon.

way the globe is pushed forward by the spoon, and the tissues of the orbit are pressed backward by the hollowed spatula. The optic nerve thus remains uncovered for a distance of 1 cm. or 1½ cm. The surgeon next introduces the scissors into the space between the two blades of the instrument, and cuts the optic nerve as near as possible to the spatula. In all cases of excision of the globe I have been able to cut the optic nerve at a distance varying from 1½ cm. to 2 cm. from the eyeball.

The instrument is made by Collin, of Paris.

REVIEW.

THE DIAGNOSTIC SIGNIFICANCE OF THE PUPIL AND ITS REFLEXES.

BY

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ALTHOUGH the anatomy, physiology, and pathology of the pupil and its movements have been under constant investigation during the past ten years,

it cannot be said that a great deal has been added to our precise knowledge of their significance in the region of general medical diagnosis. Nevertheless, it may be useful to attempt, by a general survey of the subject, to indicate broadly the points concerning which a general agreement has been reached, as well as those which are still under discussion, and with regard to which further investigation is required. The reviewer's task is simplified to some extent by the recently published monograph of Bach[1], in which will be found abundant references to the literature of the subject. Less extensive but useful bibliographies will also be found in the articles by Heddäus in the Graefe-Saemisch *Handbuch*[2], and by Morax in the French Encyclopædia of Lagrange and Valude[3], while the subject is well discussed in the recently published work by Posey and Spiller[4].

In spite of the large amount of labour which has been devoted to the elucidation of the problems connected with the pupil and its movements, there still remain so many gaps in our knowledge that it is necessary to be warned against the danger of over-estimating the value of pupillary symptoms in diagnosis. Probably of no disease can it be said that a pupil symptom is pathognomonic. It is much more often only a link in the chain of evidence, while in many cases the state of the pupils, although fairly constant for the disease in question, belongs also to other conditions, and has, therefore, little or no diagnostic significance.

In reading the literature of this subject, one is much impressed with the need for a closer study of the methods of conducting the examination of the pupil, and of recording the results. Examples need not be given, but many records fail to convey any useful information, owing to want of completeness and precision in the details given. The discussion of the methods of examination does not come within the scope of this review, but the reader may be referred to the works of Bach, Heddäus, and others for details of the systematic investigation of the pupil, attention to which will prevent the omission of important or essential points. There is still a dearth of trustworthy evidence with regard to the value of many of the recognised pupil symptoms, and every carefully examined and accurately recorded case is a real contribution to the subject.

Although many of the so-called "reactions" to be mentioned in this paper have little or no significance, yet a knowledge of them all is essential, if it were for no other reason than to guard against errors in interpretation. The same applies to the physiological variations of the pupil, the quasi-pathological conditions, and the congenital peculiarities, any of which may lead to errors in diagnosis if not kept constantly in mind.

The Normal Pupil.

The normal pupil is accurately circular in shape, placed eccentrically as regards the cornea, but contracting concentrically with itself. The pupils should remain of equal size in all states of illumination, accommodation, and convergence, and whether light falls on one eye alone or on both simultaneously. Bach[1] states that normally if one eye is more strongly illuminated than the other, the pupil on the better lighted side will be smaller. In this statement he is supported by Pick [5], but Heddäus [2] holds that even with one eye brightly illuminated and the other in darkness, the pupils are equal. The consensus of opinion is that with the degrees of illumination usually employed, no inequality of the pupils can be detected by the naked eye, even with inequality of illumination.

It is obvious that no absolute figures can be given as representing the normal size of the pupil. Among normal persons its size varies within fairly wide limits. Where an abnormality of size is suspected, comparison with the pupils of the same individual in health would be a reliable guide, but is seldom available. When the abnormality is one-sided, the standard of comparison exists on the healthy side.

Broadly speaking, pupils which, in diffuse daylight, are less than 2·5 mm. or more than 5 mm. in diameter, are abnormal.

Age affects the physiological size of the pupil to some extent. The average diameter is greatest before the age of 20, remains stationary between 20 and 50, and thereafter declines. In the newborn and in the aged the pupil is very small.

The *refraction* of the eye also has an influence on the size of the pupil. A number of investigators have found that the average diameter of the pupil tends to be greater in myopes and smaller in hypermetropes than in emmetropes.

In sleep, the pupils are small, and it is important to bear in mind that on wakening, the pupils dilate widely, the dilatation persisting until the individual becomes fully conscious, after which the pupils gradually return to their normal diameter. Even the presence of a bright light does not prevent the occurrence of the preliminary dilatation. As it has been known to lead to errors of diagnosis, it is well that this fact should be kept in view. The commonly accepted explanation of the myosis of sleep is that it is due to the absence of the sensory and psychical stimuli which cause dilatation during the waking state. There is much to support this view, but it is only fair to state that it is not universally accepted, and that several other explanations have been offered.

Mechanism of the Pupillary Movements.

This need not be discussed in detail. Suffice it to say that a number of theories have been formulated to account for the movements of the iris, by changes in the fulness of the vessels of the iris, by changes in the ocular tension, by the elasticity of the iris tissues and vessels, and by inhibition and stimulation of the action of the sphincter. While it cannot be denied that these factors play a part in determining the size of the pupil, and especially that dilatation of the pupil may be brought about by inhibition of the action of the sphincter, the most widely-accepted theory is that the iris possesses two antagonistic muscular structures: the circular pupil contractor and the radial pupil dilator, innervated respectively by the third nerve and the sympathetic.

The Normal Pupil Reflexes.—Anatomical and Physiological Considerations.

1. **The Light Reflex.**—When light is allowed to enter the eye, there follows, after a latent period of approximately half a second, a contraction of the pupil. This is usually succeeded by a somewhat slower dilatation of smaller amplitude, and that, again, by several small and diminishing contractions and expansions, before the pupil assumes its final contracted state. This process may require several seconds for its completion. The degree of the contraction is influenced by the strength of the illumination, the part of the retina on which the light falls, and the state of adaptation of the eye. Attempts have been made to standardise the physiological width of the pupil and the amplitude of the light contraction, by the use of known intensities of

light. The standard illumination used is the metre-candle, and it has been found that with any degree of illumination between 100 and 1,000 metre-candles, the final size of the contracted pupil is the same. The larger the area of retina illuminated, and the nearer it lies to the fovea, the greater the contraction of the pupil. When, however, by the employment of special apparatus, light can be thrown into the eye without being allowed to fall upon the fovea, it is found that with the light intensities employed in practice, no contraction of the pupil occurs. As the result of such experiments, Hess[6] concluded that only a small central area of the retina, about 3 mm. in diameter, was sufficiently sensitive to transmit a "pupillomotor" stimulus. Hesse[7] working under more favourable conditions, found that with the intense light of the electric arc he could elicit pupillary contraction from parts of the retina 40 or 50 degrees from its centre. He agrees, however, with Hess and Heddäus that for the illumination likely to be employed in practice the peripheral parts of the retina are insensitive. The importance of these investigations will appear in the discussion of the hemiopic pupil phenomenon. Illumination of one eye only, produces a weaker contraction of the pupil than the simultaneous application of the same illumination to both eyes.

The light reaction of the pupil is elicited by a relatively small light stimulus if the eye has been previously for some time in the dark.

Gradual increase of the light falling upon the eye produces little or no effect on the pupil, while a sudden increase up to the same intensity produces a well-marked pupillary contraction.

Consensual light reflex.—Illumination of one eye alone causes equal contraction of both pupils, and illumination of the second eye causes additional but still equal contraction of both pupils.

As has been already stated, Bach and others have recently revived the view, held by those who first described the consensual light reflex, that in most individuals the pupil of the illuminated eye is somewhat smaller than its fellow. This is said to be visible to the naked eye after illumination has been maintained for a few seconds. In view of the directly contradictory opinions which are held with regard to this matter, further careful investigations seem called for.

Galvanic light reflex.—It has been known for some time that the application of a galvanic stimulus to the eye produced, not only a sensation of light, but also a pupillary contraction. Bumke[8] has recently investigated this interesting phenomenon. He finds that employing a current of 0·3 m.a., with the anode over the eye, closure of the circuit produces a visible contraction both of the homolateral and of the contralateral pupil. A somewhat weaker stimulus suffices to cause the light sensation alone, and these bear to each other a fairly constant relation. Stronger currents are needed to produce the effect with the kathodal opening, anodal opening, and kathodal closure.

The path of the light reflex.—The path begins in the retina, according to Schirmer[9], in the amacrine or prereticular cells, but according to Hess[10] and Hesse[7], in the outer limbs of the cones. In the optic nerve it is formed by the coarser fibres. Partial crossing occurs at the chiasma. Thence each optic tract carries the uncrossed fibres of its own side along with the fibres which have crossed from the opposite optic nerve. The pupillary reflex fibres have been traced as far as the lateral zone of the anterior corpus quadrigeminum, and thus far the various investigators are agreed; but the afferent path beyond this point remains undefined, and is still the subject of keen controversy. It is agreed that the visual and pupillary reflex fibres contained in the optic tract separate at the external geniculate body, the former passing on to the optic radiations and occipital cortex. Bernheimer[11] claims to

have traced the reflex fibres (by experimental research on the monkey) to the neighbourhood of the oculomotor nucleus. Bach doubts the accuracy of this observation. He and Dimmer have not been able to follow the fibres further than the lateral portion of the anterior corpus quadrigeminum. Other authors claim to have traced connections with the pulvinar, corpus hypothalamicum, and ganglion habenulæ. Bernheimer places the sphincter nucleus in the small-celled median portion of the oculomotor nucleus under the aqueduct of Sylvius (the so-called Edinger-Westphal nucleus), to which the afferent pupillary reflex fibres pass, and from which issue the efferent motor fibres for the sphincter. Bach's view is that the first neurone of the light reflex arc ends in the cellular zone in the lateral region of the anterior corpus quadrigeminum, and thence the path is continued by intercalary cells which carry the impulses to the sphincter nucleus, both of the same and of the opposite side. The sphincter nucleus he locates in the median part of the anterior segment of the oculomotor nucleus, and he rejects the Edinger-Westphal nucleus. Further, Bach does not agree that connecting fibres pass between the sphincter nuclei of opposite sides. He assumes instead a partial decussation of the motor path from the nucleus to the sphincter. This enables him to explain such a phenomenon as the unilateral Argyll Robertson pupil, as well as the preponderance of the direct over the consensual light reflex, which, however, is not accepted as a fact by all observers. Although the partial decussation of the efferent path is quite hypothetical, there is a certain amount of evidence in its favour, and most phenomena which demand the assumption of a direct connection of the two nuclei, can be equally well explained on this hypothesis.

The question as to the nucleus of origin of the sphincter motor fibres is still unsettled. Bernheimer[13] and many others believe that it is to be found in the Edinger-Westphal nucleus, but a large number of recent investigators have concluded that this cell group forms no part of the oculo-motor nucleus, and that its function is still unknown. The subject is considered at length in the monograph of Tsuchida[12]. Most authors are agreed that the corpora quadrigemina can be destroyed without interfering with the light reflex. Some observers doubt whether the oculo-motor nucleus has any connection with the light reaction of the pupil.

Passing to the centrifugal side of the pupillary reflex arc, the fibres which originate in the sphincter nucleus, pass ventrally and join the other fibres of the third nerve. The actual point at which the junction occurs is not known. Passing in the third nerve they leave it in the orbit to enter the ciliary ganglion by its short root. The researches of v. Michel, Marina[18], Langendorff[19], and others, have proved that the first efferent neurone ends in the ciliary ganglion, the constrictor impulse being carried thence to the sphincter of the pupil by sympathetic fibres. These pass by the short ciliary nerves, pierce the sclera, and run in the supra-choroidea to the ciliary body, where they form an anastomosis, from which the terminal filaments pass to the sphincter muscle.

The only important departure from the above description of the path of the pupil light reflex is the scheme of Bach and Meyer[14 and 15] which includes two reflex arcs. The first is completed at the anterior corpora quadrigemina and corresponds closely with that above described, the second, somewhat vaguely defined, passes from the corpora quadrigemina to the spinal end of the medulla oblongata, thence, *via* the posterior longitudinal bundle, to join the third nerve. The reflex centres for this arc lie near the middle line in the neighbourhood of the respiratory centre at the spinal end of the fourth ventricle, and are two in number, one an inhibitory centre controlling the pupillary light reflex, and

the other an inhibitory centre controlling the stimuli which cause dilatation of the pupil.

These conclusions are drawn from experiments on cats, rabbits, and monkeys, the details of which are easily accessible and need not be discussed here. The experiments have been performed with variations by Levinsohn[16] and Ruge[17] with somewhat variable results. While these researches deserve careful consideration, it cannot be said that their conclusions are proved. The difficulties and the fallacies are innumerable, and the results obtained do not seem to justify any consistent hypothesis.

2. **The near vision reflex.**—When the eyes are directed to an object a short distance before the face, the pupils contract. This contraction occurs whether the eyes are shaded or exposed to light, it occurs in both eyes, even when one is excluded from fixation, also in one-sided amblyopia, and, even in the totally blind, the reaction may be observed if the patient is directed to make an effort to see his own hand held near his face, provided that convergence of the eyes occurs. Errors of refraction do not interfere with the reaction, as in anisometropia the pupils remain equal in convergence. Atropine abolishes this reaction, but the pupil dilated by a weak solution of cocaine contracts in near vision. Bach[1] found that if the patient's gaze was first directed into the distance, and then rapidly to a near object, no perceptible contraction of the pupils occurred if the fixation object were more than 40 centimetres distant, and that the amplitude of the contraction increased as the object was brought nearer, at least until it was 10 centimetres from the eyes.

This reaction was first carefully examined, according to Bach, by Scheiner (1619), and by him it was described as associated with accommodation. This assumption has been repeatedly disputed, and many investigations have been conducted to determine whether the reaction is dependent on accommodation or convergence. The first difficulty in the way of a definite answer to this question, lies in the difficulty of dissociating two functions like accommodation and convergence which normally act in harmony. Even if we make arrangements whereby the necessity for the one is excluded while the other remains active, we have no guarantee that we have dissociated the impulses from the cerebral centres which naturally pass simultaneously to the internal recti, the sphincter iridis, and the ciliary muscle. Some careful observers have failed to detect any association between accommodation and pupil contraction (Verwoort[20] and Wlotzka[21]). On the other hand, it is well-known that in high myopia the pupil contracts with convergence to a point which is beyond the far point of the patient's accommodation. The pupil contracts in near vision in presbyopes, whose accommodation is entirely in abeyance. Cases are occasionally seen where, with destruction of sight in one eye, convergence fails to occur, while accommodation is still preserved in the seeing eye. In such a case there may be no visible pupil contraction in fixation of a near object. Again, this reaction occurs in spite of paralysis of accommodation if convergence is intact. One may therefore say that, while it is not improbable that contraction of the pupil may occur in association with accommodation alone, there is more apparent connection between convergence and pupillary contraction. It is obviously incorrect to speak of the pupils contracting "in accommodation" without ascertaining that accommodation actually comes into play. It would be more exact, as a rule, to speak of the "convergence reaction," and more accurate still, since it does not imply acceptance of a theory, to use the term "pupillary contraction in near vision" or the "near vision reflex."

In its nature this contraction is not a "reflex" in the strict sense of the term. It is more correctly described as an "associated movement." The associated impulses probably originate in the cerebral cortex and pass thence to the oculomotor nucleus, and, as regards those going to the iris and ciliary muscle, through the third nerve, ciliary ganglion, and short ciliary nerves. Cases of third nerve paralysis in which the contraction of the pupil in near vision returns but not the light reflex, make it probable that the efferent paths for these two reflexes run in separate fibres (Heddäus, *loc. cit.*).

3. **Reflex dilatation of the pupil** (The cilio-spinal reflex).—The pupil is readily influenced by sensory and psychical stimuli. Emotion, excitement, mental shock, fear, anger, a strong effort of attention, or any sudden stimulation of the tactile, pain, muscular, or special senses, causes a dilatation of the pupil. If the stimulus affects one side of the body, the dilatation will affect both pupils. The reaction is brought about by sensory stimulation of an anæsthetic area of skin if the anæsthesia is due to a central lesion or to hysteria, but it cannot be produced if the anæsthesia is due to a peripheral lesion. In this connection a diagnostic value has been attributed to the reflex by Loewy[22], who finds that the pupil, strongly contracted by exposure to light, dilates perceptibly when pressure is made upon a tender spot if the tenderness is due to organic disease. If, however, the tenderness is of a functional nature, like the pressure-spots of hysteria, no dilatation will occur. This is said to give us a means of distinguishing organic disease from the "psychogenic" tenderness of traumatic neurosis, etc.

It has long been known that stimulation of the cervical sympathetic causes dilatation of the pupil, but it is still disputed whether the reflex dilatation of the pupil on sensory stimulation is of this nature, or is due to inhibition of the tone of the pupil-contracting mechanism. Braunstein[23] found that stimulation of sensory nerves produced no reflex dilatation in patients affected with oculo-motor paralysis. Animal experiments gave no reflex dilatation to sensory stimuli if the oculo-motor nerve had been first divided, while the dilatation did occur (although in a modified manner) with intact oculo-motor nerve when the sympathetic had been divided. He also showed, by means of photographic records of the pupil movements, that the "type" of dilatation was quite different, according as it was caused by stimulation of the divided sciatic nerve or of the divided sympathetic. These observations and experiments seemed to show conclusively that the normal reflex dilatation to sensory stimuli is due to inhibition of the tonus of the third nerve, and this is the view which seems at present to be most widely accepted. To some extent it is supported by the researches of Parsons[24] and Dubois and Castelain[25], who found dilatation of the pupil from stimulation of the cortex of the brain after excision of the superior cervical ganglion, but loss of the reflex, if, in addition, the third nerve was divided. But the opposite view is taken by Anderson[26] who finds that after division of the pupillary fibres of the third nerve, pupillary dilatation is easily elicited by sensory stimuli, while the same procedure, *plus* section of the cervical sympathetic, abolishes the reaction. Bach and Meyer, on the basis of their experiments, suggest that the medulla may play a part in the reflex. Where the findings of such experienced investigators are so much at variance, it is evident that further research is required. The cerebral cortex certainly comes into play in the psychical reflex, but whether it does so in the sensory reflex is still disputed. On the whole, experiments seem to show that it does. The following may be taken provisionally as the reflex path for the sensory dilatation of the pupil—peripheral sensory nerve, cerebral cortex, oculo-motor nucleus (whose tone is inhibited), ciliary ganglion, and short

ciliary nerves to the sphincter pupillæ. When the stimulus is a psychical one, it starts in the brain and follows the path given.

Whether the sympathetic does or does not come into play in the sensory pupil reflex, its influence on the pupil remains undisputed, and since pathological conditions involving the sympathetic give rise to abnormalities of the pupil to be described later, it is necessary to indicate the nature of the sympathetic supply to the iris. The fibres, which originate in the cells of Budge's cilio-spinal centre, leave the spinal cord by the anterior roots of the eighth cervical and first and second dorsal nerves, pass by the corresponding rami communicantes to the first thoracic ganglion, thence to the inferior and superior cervical ganglia. The path is broken at the superior cervical ganglion, where a fresh neurone carries it to the Gasserian ganglion, where it joins the first division of the fifth cranial nerve. It does not enter the ciliary ganglion but passes by the long ciliary nerves to the iris. The position of the cilio-spinal centre has been recently defined by Herring[27] for the cat. After section of the cervical sympathetic he found chromatolysis and atrophy in the multipolar cells in the lateral horns of the same side of the cord. These cells begin above, at the level of the spinal origin of the eighth cervical nerve and are most numerous in the second and third thoracic segments, then decrease in numbers to the sixth segment.

Interruption of the above path at any point causes contraction of the pupil on the corresponding side, irritation leads to dilatation. Most of the pathological changes which influence the pupil through the sympathetic do so by irritation or destruction of the path from the cilio-spinal centre to the iris. Physiologically, the cilio-spinal centre is supposed to be under the influence of impulses reaching it from the periphery by the sensory nerves and from the medulla and cortex cerebri. As already indicated, however, this subject is involved in a good deal of uncertainty.

Normal Oscillations of the Pupil.—In connection with the sensory and psychical pupil reflex it is perhaps well to consider the condition spoken of by the Germans as "pupillary unrest," a physiological occurrence which is often described as hippus, under the mistaken idea that is is pathological. It is desirable that a clear distinction should be drawn between the normal oscillations of the pupil and the abnormal oscillations which undoubtedly occur in some diseases, and that the term "hippus" should be reserved for the latter. The normal pupil shows constant fine movements of expansion and contraction which are independent of the heart-beat, the respiratory movements, and changes of the blood-pressure. The movements are not quite regular in time or amplitude, and occasionally they cease for a period of one or two seconds.

Bach[1] holds that the phenomenon is a manifestation of the sensitiveness of the pupil to psychical and sensory stimuli, and that it is independent of the intensity of illumination and of convergence. Heddäus[2], on the other hand, says that the normal oscillations of the pupil are entirely due to the light reflex, on the grounds that the oscillations are best marked where the light reflex is most active, that they are better in good light than in poor light, and absent in the dark, that they resemble the light reflex in being equal and simultaneous in both eyes, that the pupil of one eye if shaded, moves with that of the illuminated eye, and that the pupil of an eye which has lost its sensibility to light shows no movement if the normal eye is covered.

There is every reason to believe that all the various stimuli which influence the normal pupil play a part in the production of these physiological oscillations, and that they are the resultant of the many influences, exciting and inhibitory (if there be such), passing to the iris *via* the third nerve and the sympathetic.

4. **The oculo-pupillary and trigeminus-facial reflex**.—These reflexes can be elicited in many, if not in most, normal individuals. The commonest form seems to be a special variety of the reflex dilatation on sensory stimulation already alluded to. V. Varady[28] elicits it by maintaining firm pressure with a lacrymal probe on the skin at the external canthus, or pricking the skin of the cheek with a needle for about thirty seconds. His description of the reflex is as follows : "The pupil dilates slowly and completely, then contracts smartly to less than its original size. After this first oscillation if the stimulus is continued the dilatation begins again, persists for two minutes, and then the pupil slowly contracts. When the stimulus ceases the pupil returns to its original size." The changes also occur in the pupil of the contralateral eye. The reflex can be elicited by tactile, thermic, or electrical stimuli applied to the lids, conjunctiva, or cornea, but stimulation of the two latter is more likely to cause the other form, which consists in a reflex closure of the lids with myosis.

The path given by Bach for the trigeminus-facial reflex is.—Fifth nerve terminal, trunk, and nucleus, thence to cortex cerebri, seventh nucleus, posterior longitudinal bundle, sphincter nucleus, third nerve, ciliary ganglion, and short ciliary nerves. It is said that if these reflexes are elicited from an area of skin which is anæsthetic the anæsthesia must be functional.

5. **Lid-closure reflex** (orbicularis reflex).—Few pupillary phenomena have received so much attention as this. It is often described as the Westphal-Piltz phenomenon or the Gifford-Galassi reflex, after some of those who have discovered and described it. It had been described, however, at an earlier date by von Graefe.

The reflex consists in a well marked contraction of the pupil on closure, or attempted closure, of the lids. It can be best observed by holding apart the lids of one eye, while the patient obeys the order to close the eyes firmly. The earliest observations were made in cases of reflex rigidity of the pupil and it can be most easily elicited in such cases, the reason no doubt being that no light reflex is present to cause confusion. With due precautions, however, the reflex can be found in a considerable proportion of healthy persons. It can be made more evident by producing first a slight irritation of the dilator by a weak solution of cocaine. It is abolished by the use of atropine, homatropine, eserine, &c.

Schanz[29] thought the phenomenon due to hyperæmia of the iris, brought about by pressure of the lids on the vessels at the limbus, but it occurs even if contact of the lids with the eyeball is prevented. Westphal[30 and 31] attributed it to stimulation of certain sensitive spots on the eyeball by the pressure of the lids.

A more plausible theory is that advanced by A. von Graefe[32], namely, that it is an associated movement of the iris, due to simultaneous excitation of the nuclei of the seventh and third nerves, or, in the words of Gifford, an overflow stimulus from the facial nucleus to the oculomotor nucleus *via* the posterior longitudinal bundle. We must also consider in this connection the theory of Mendel that the orbicularis muscle is primarily innervated from the oculomotor nucleus. A possible connection between the facial nerve and the ciliary ganglion has also been mentioned. This is suggested by the observation of the lid-closure reaction in a pupil which fails to contract either to direct or consensual light stimuli or in convergence (Bach).

The importance of the phenomenon seems to lie chiefly in the fact that it may lead to a mistaken description of "paradoxical reaction" or some other abnormal movement of the pupil.

6. **The cortical reflex of Haab** (attention reflex.)—This consists in a

visible contraction of the pupil, which occurs when the individual under observation, looking straight before him in a dark room, directs his attention, but not his gaze, to a small light placed some distance in front and to one side of him. It occurs in healthy persons. Several observers have confirmed Haab's statements regarding this phenomenon, while others have been unable to convince themselves of its occurrence. The stimulus for the pupil contraction is supposed to issue from the cerebral cortex.

Our present knowledge of the reflex does not enable us to attach any diagnostic value to it.

(*To be concluded.*)

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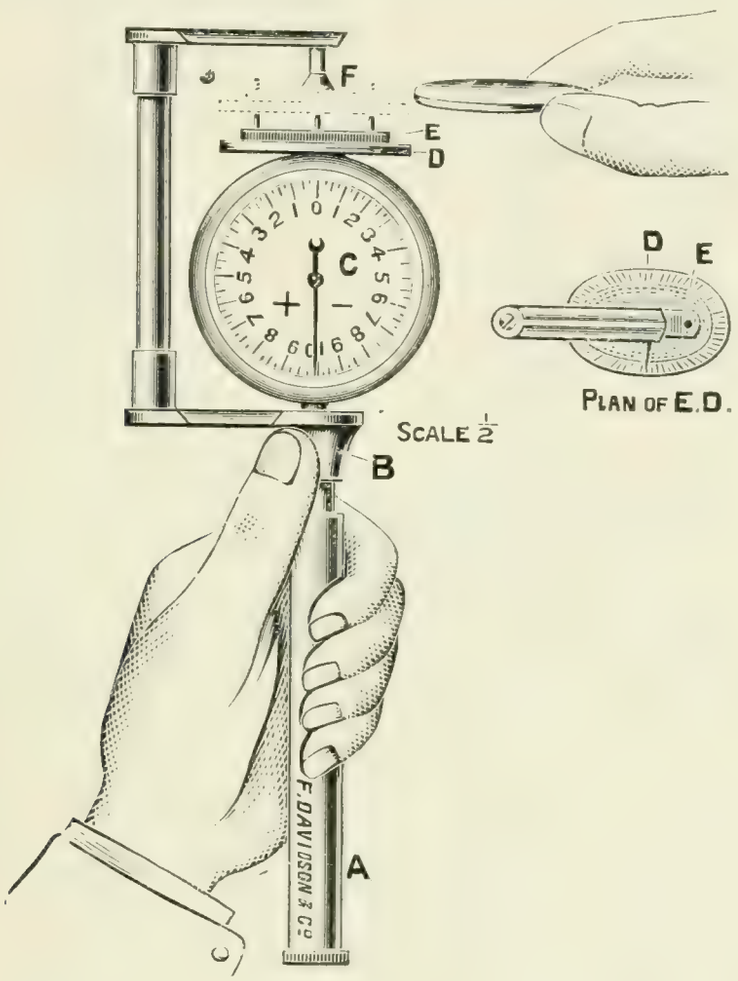
NOVELTIES.

AN IMPROVED LENS TESTER.

ONE of the most interesting appliances introduced by Messrs. F. Davidson and Co., 129, Great Portland Street, at the recent Ophthalmological Exhibition, was an instrument for measuring the focus of spherical or cylindrical spectacle lenses, which, in addition, enabled one immediately to locate the meridian in

which the axis of the cylinder happened to be. This is a decided improvement, and the simple manner in which the information is obtained is not the least of its merits. A reference to the illustration will serve to show the mechanism. It will be seen that the lens to be tested is placed on the 3 points E, after the press F has been raised by upward pressure on the part B. On releasing B, the press F holds the lens in position. The lens is then revolved as with the usual lens-measure. If the surface being tested is spherical

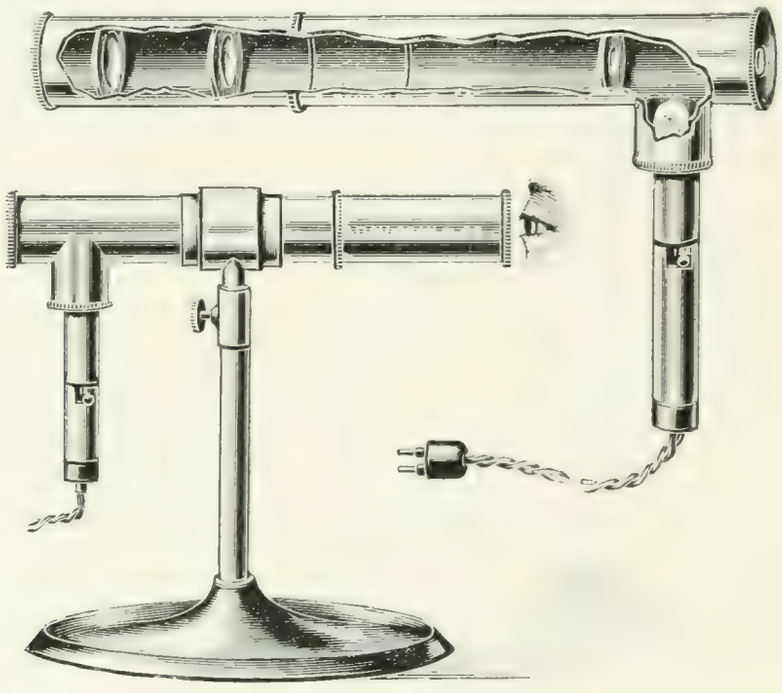


there is, of course, no movement of the hand on the dial, which at once indicates the curve of that surface. If, however, the surface is cylindrical, the lens is turned until the maximum figure is recorded. The protractor D, situated underneath the lens, is then rotated until it coincides with the shape of the lens, when the angle can be read off at once. At the price of 30s. it is an expensive appliance, but it is exceedingly well-made.

A SELF-LUMINOUS MICROSCOPE.

THIS is another ingenious instrument by Messrs. F. Davidson & Co., and it is worthy of recommendation. It is a low-power microscope giving a magnification of thirty-five diameters and illuminated from within by a metallic filament lamp. The object lens is adjustable for two fixed foci. For corneal examination it is brought as near the lamp as possible, while for examination of the skin it is taken to its farthest point away, in order that the microscope may be

brought on to the spot to be examined. It is the most effective portable instrument at a moderate price that we have yet seen. Incidentally, we may mention that the dry batteries supplied with this and *all* Messrs. Davidson's electrical instruments is their new "Davon." This possesses the valuable property of not



deteriorating materially if not used for some months, and the fact that it may also be used for light cautery work renders it especially valuable. The microscope can be had either with or without the stand. For examination of the cornea the latter is preferable.

TRANSLATION.

ON TUBERCULINS T.R., B.E., T.B.K.

Their powerful curative effect on Ocular Tuberculoses, Tuberculides, and Tuberculies.*

(*Concluded.*)

BY

DR. LOUIS DOR,

LYONS, FRANCE.

WHEN I commenced tuberculin-therapy Davids' work had not yet appeared, and in the literature there was no question of anything except old tuberculin and tuberculin T.R. I was, therefore, unable to employ tuberculin B.E. Old tuberculin had been given up by everybody, and so I would apparently have to employ T.R. like other people. But a conversation with Dr. F. Arloing led to my adoption of Béraneck's tuberculin on account of the way it is prepared. I will speak presently on the mode of preparation of the various tuberculins.

*Des Tuberculines T.R., B.E., T.B.K.; leur action curative puissante sur les tuberculoses, les tuberculides et les tuberculies oculaires. *La Clinique Ophtalmologique*, 10 avril et 10 mai, 1909.

I wish, first of all, to publish my therapeutic results. I have treated eight patients with Béraneck's tuberculin. Three cases of *parenchymatous keratitis* were cured completely. One very chronic case of *serous iritis* with vitreous opacities has been improved and ought to return in the spring to recommence the treatment.

My fifth case is that of a young girl who has been cured of pulmonary tuberculosis, and of *iritis with adhesions*. Three months of atropin had not caused the adhesions to yield. She has been cured of her iritis without iridectomy, and all the adhesions became detached one after the other. She still has slight scleritis. I have treated her for several months. She has put on 7 kilogrammes in weight, and no longer has the headaches of which she had complained for several years. She has stuck well to her injections, which usually she performs herself, and I have every hope of a complete cure. The V.A. is 0·6, though it is true it has never been below 0·4.

A sixth case is that of a patient who not only had a *bilateral tuberculous iritis* with very obvious tuberculous nodules, but also a *double retinal detachment*. The iris nodules melted, like snow in the sunshine, and the retinal detachment is completely cured as regards one eye, and nearly so as regards the other. The general condition has considerably improved. A seventh case is one of *episcleritis* of two months' duration, which disappeared in a week in a surprising way.

Lastly, my eighth case is that of the young girl with retinal detachment which I published in the March number of *La Clinique Ophtalmologique*.

My cases are not absolutely on all fours with those of Hippel or of Rohmer. I have, more especially, treated cases of what I have called *la tuberculie* ([47]), as opposed to tuberculosis and to tuberculides. I understand by *tuberculie* an inflammation caused by the tubercle bacillus or its toxins without the formation of tuberculides or tubercles (*tubercules*); interstitial keratitis, diffuse scleritis, vascular keratitis, neuritis, and retinal detachment are manifestations of *tuberculie*, while nodular episcleritis and phlyctenular keratitis are *tuberculides* and iridic nodules are genuine *tubercles*. Genuine tubercles may also be observed in the cornea, the retina, and the choroid. *Tuberculie* is synonymous with what Poncet calls inflammatory tuberculosis, but this latter expression is one I do not like, because it might lead to the idea that one were speaking of ordinary tuberculous affections, complicated by inflammatory phenomena, as opposed to quiet tuberculosis (*tuberculoses torpides*). So I created the expression *la tuberculie*.

Since I have treated more particularly cases of *tuberculie*, whilst the authors of whom I have spoken, with the exception of Stock, have treated almost exclusively cases of tuberculosis, it is difficult to compare my observations with those of the German authors. I would rather wait until the number of cases of *tuberculie* treated by tuberculin T.R. or B.E. is greater and, on the other hand, until the number of cases of tuberculosis treated by myself or others with Béraneck's tuberculin is sufficient to allow of comparison between the two methods.

If I had not happened to cure patients with tuberculin T.B.K., if I had not seen surprising improvements of general health, and observed local modifications such as the complete reattachment of two detached retinæ, the almost complete reattachment of a third, and the disappearance of iritic adhesions which had been resistant to atropin for three months, I would willingly give up my attempts and range myself beside von Hippel, but it appears to me that there is nothing to make me give up my experiments. When retinal detachments have been cured with tuberculin B.E., I shall see that it is due to better *technique* and if I find that I cannot cure nodular tuberculosis of the iris as

quickly and completely as von Hippel, I shall take care to say so. At the present moment, I have treated only one such case, but in this case I saw two large tubercles, more than 3 mm. in diameter, melt away in eight or ten days. I do not know what more one could want. I believe, then, that along with tuberculin T.R. and B.E. there is room for very careful study of tuberculin T.B.K.

Next let me say a word on the composition of these various tuberculins, for it is important to know exactly what one is doing in undertaking tuberculin treatment.

Koch's *old tuberculin* is prepared as follows :—A four per cent. glycerinated bouillon culture (*une culture de bouillon glycerénè à* 4%) is left in the oven at 37°C. for thirty days. This culture is sterilized at 110°C., then concentrated to one tenth of its original volume. Filtration yields a liquid which is tuberculin. The tuberculin which is delivered to veterinary surgeons for the diagnosis of bovine tuberculosis is still prepared in this way at the Pasteur Institute, and it is this tuberculin which is employed also for the various ophthalmo-,cuti-,or intra-dermo reactions, of Wolff-Eisner, Calmette, etc. At Lille this tuberculin is precipitated by 9 volumes of 95 per cent. alcohol and redissolved twice, and then precipitated to purify. This tuberculin is titrated by intra-cerebral injection in the healthy guinea pig, which is killed at a dose of 5 milligrammes.

This old tuberculin has been given up for therapeutic purposes * and is now employed only for diagnosis. Is this right or wrong? With it one looks for a reaction, and uses it diluted to one-hundredth. Who can tell whether by using it prudently, and avoiding reactions one could not cure with it certain toxic manifestations of tuberculosis?

Tuberculin T.R. and tuberculin T.O. are prepared simultaneously. A culture of the bacillus is pounded in an agate mortar. It is treated with a glycerine solution and centrifuged. The upper part is tuberculin T.O., and the plug at the bottom which contains everything which is insoluble in glycerinated water, constitutes tuberculin T.R. Pounded bacilli! *A priori* that inspires but faint confidence. On the prospectus which goes with each phial it is stated that this tuberculin inoculated into guinea pigs has never caused tuberculosis in any of them. But once would be enough. It is true that the product is not injected into healthy subjects, but into sick people, and under these circumstances, a bacillus more or less hardly matters.

Tuberculin B.E. is also an emulsion of pounded bacilli, but this time not centrifuged. The pounded bacilli are left to macerate in water, glycerinated to 50 per cent., and an emulsion is made in the proportion of 1 gramme of bacilli to 200 grammes of glycerine water. This emulsion consequently contains all the tubercle toxins, that is to say, the toxins soluble in glycerine water such as the old tuberculin, the toxins soluble in pure non-glycerinated water, in ether, in chloroform, and in caustic soda. It is this mixture of toxins which gives to tuberculin B.E. its curative value. Here, then, we have all together tuberculin T., tuberculin T.R., ethero-bacillins and chloroformo-bacillins of Auclair, Calmette tuberculin, Béraneck's tuberculin, Auclair's proteine; nothing is awanting, since nothing has been thrown out. It's enough to give one cold shivers, but for the knowledge that this tuberculin is used at first in the dose of millionths of a milligramme.

Every one does not follow Koch in this path; thus, Denys has made a

*Except at Bordeaux. See the Thesis of Tardieu, 23rd December, 1908, of which I heard only when correcting proofs.

tuberculin on the lines of the original tuberculin, with the difference that he does not sterilize the cultures by heat ; consequently, he preserves certain substances which heat would coagulate, and eliminates others which in Koch's tuberculin are extracted by heat.

Calmette (Lille), on his part, resorts only to toxins soluble in pure water, to the exclusion of those which are soluble in glycerine water. This is how he prepares tuberculin C.L. He macerates at 58° C. for fifteen days in pure sterile water the tubercle bacilli, unheated, and previously freed from the substances soluble in glycerine water. At the end of fifteen days, he filters, and precipitates the liquid with nine volumes of a mixture of equal parts of alcohol and ether.

The precipitate is dried, and is then titrated by intracerebral inoculation in the healthy guinea pig, which is killed at a dose of from 0·50 to 0·80 milligramme. It is by no means bulky, yet as one can see, very toxic. This tuberculin, prepared at a low temperature, contains neither salts, peptones, nor resino-waxy bodies. According to Calmette, who has been kind enough to give me particulars himself, it is very well borne by patients, who rapidly become accustomed to gradually increasing doses, of an amount never sufficient to cause reaction. The treatment commences with a ten thousandth of a milligramme and is increased at each injection, but as soon as there is a sign of any reaction, the dose is again reduced. According to Calmette, this tuberculin seems to give to tuberculous people a very high resistance.

Now as to Béraneck. He prepares a mixed tuberculin, which includes both the toxins soluble in glycerine water and those which are insoluble ; but as to the latter, instead of contenting himself with blending the mass of pounded bacilli he extracts the endo-toxins from the bacilli by treating them with 1 per cent. orthophosphoric acid. The danger of injecting whole bacilli is avoided, and, on the other hand, the toxins which are soluble and those which are insoluble in glycerine water are both utilized. This method of preparation has seemed to me preferable to the preparation of tuberculin T.R. when I have had to select a tuberculin for therapeutic use. Is not the method of extraction of endo-toxins by means of phosphoric acid a more confidence-inspiring *technique* than that of pounding the bacilli ? It is true that the orthophosphoric acid does not extract all the toxins.

All these considerations must evidently yield to clinical facts ; but, for the moment, what do these clinical facts teach us ? They teach us that one can cure certain tuberculoses either by tuberculin T.R., or by tuberculins B.E., C.L., or T.B.K., that one never aggravates tuberculosis by these tuberculins on condition that a *technique* is adopted which is different from that advised by Koch in 1890, on condition, *i.e.*, that all local or general reaction is avoided with the greatest possible care. There is nothing for it but to study the matter closely and make comparative observations with various tuberculins.

Much investigation remains to be done ; who can tell whether some day it will be possible to recognise that such and such a form of tuberculosis demands insoluble toxins, such another form toxins, soluble only in pure water like that of Calmette, or soluble in ether, or chloroform, or even this casein quite recently described by Auclair and Paris ([48]).

We must draw no hasty conclusions and must proceed methodically. von Hippel says that iridic tuberculoses cure better with tuberculin B.E. than with tuberculin T.R., and every one has given up the old tuberculin. I say that in one case tuberculin T.B.K. also has done very well. From this we can draw the conclusion even now that iridic tuberculosis requires treatment preferably

by toxins insoluble in glycerine water. As a matter of fact, toxins of this kind exist in tuberculin T.B.K.; those, namely, which are extracted by phosphoric acid. They exist also in T.R. and B.E. For iridic tuberculosis, therefore, it appears that toxins which are insoluble in glycerine water are preferable to others, but in the forms which are of the nature of *tuberculie* there are some cases in which sclerosis, and others in which œdema predominates. These cases probably require a different antitoxin.

Tuberculous toxins cause sclerosis, œdema, caseification, hæmolysis, rise of temperature, or simply dystrophy in different patients.

What does this mean? Do the bacilli sometimes secrete certain toxins, sometimes certain others? It is possible, but not probable. The natural hypothesis is that each patient is responsible for his own brand of tuberculosis (*chaque malade fait sa tuberculose*).

One patient is armed against the temperature-raising and caseifying toxins, but not against sclerosing toxins; another patient, on the contrary, has a natural defence against sclerosing toxins, but cannot fight the others. Therefore, when, in the future, which I hope is not far distant, we possess as many different tuberculins as there are tuberculous toxins, this or that toxin will be indicated against a given form of the disease. In the meantime, it is very necessary to make as many clinical observations as possible. Conjunctival tuberculosis is resistant to tuberculin T.R., and is only slowly influenced by B.E., while tuberculosis of the iris is very quickly cured by these tuberculins. Tuberculous detachment of the retina is rapidly cured by tuberculin T.B.K. These are temporary landmarks which serve to guide us and around which we may group other landmarks.

This would not be my review if I did not now suggest a hypothesis as to the mechanism of the cure of tuberculosis by tuberculin. How are we to explain the fact that an organism which harbours tubercle bacilli and which, consequently, ought to be impregnated with tuberculin, requires for its cure fresh quantities of tuberculin? In order to reply to this question, I shall call to my assistance the ophthalmo-reaction. This phenomenon, by itself a mysterious one, is at any rate a proof that the body of the tuberculous individual is not impregnated with tuberculin. Further, if a patient is given numerous injections of tuberculin his ophthalmo-reaction disappears.

So that the tuberculous patient is not impregnated with tuberculin, otherwise the ophthalmo-reaction would be inexplicable. We must suppose that there is in him a specific antibody of tuberculin, which combines strongly with it, and that is why the instillation of a drop of tuberculin into the eye of a tuberculous patient causes a reaction which is not obtained in a normal eye. Up to this point the hypothesis is quite ordinary, and such as probably first comes to the mind of most of us. But to continue; I have said that the ophthalmo-reaction disappeared when the organism is impregnated with tuberculin, and I believe that it is the disappearance of this reaction which allows of cure.

My inspiration is derived from experiments I once made on the cytolysis of cancer. When an emulsion of cancer cells is injected under the skin of an animal, specific cytolytic substances appear in the serum of this animal which select and destroy the cancer cells (*qui détruisent les cellules cancéreuses avec élection*); but soon there appears a new anti-body which is antagonistic to the specific cytolytic substance, and from this time the cancer cells are no longer attacked.

If this idea be applied to tuberculosis one may suppose that every tuberculosis causes, in the serum of the individual, the appearance of a specific tuberculinolytic anti-body, and during this period the injection of

tuberculin causes an intense reaction. But if one inject more tuberculin, there then develops a new substance, which is antagonistic to anti-tuberculin, and at this point the contest ceases. This is the repose which follows guerilla warfare; the organism no longer fights against each fresh impregnation with tuberculin by local and general specific reaction; it fights by other means, by which it is enabled to get rid of foreign bodies in general. This hypothesis is favourable, I must recognise, to tuberculin therapy by bacillary emulsion to the exclusion of tuberculins which utilize only a part of the tuberculous poisons (old tuberculin, tuberculin T.R., Calmette's tuberculin, Denys' tuberculin, and Béraneck's tuberculin), but it is, in the first place only one hypothesis, many others may occur to the imagination, and in the second place there is nothing to prove that in suppressing the reaction with regard to the more violent of the tuberculous poisons, one has not a sufficient practical effect. Well, Calmette and Béraneck have made their tuberculins with precisely those toxins which are the most virulent of those formed by the bacillus, and tuberculin T.R. is also much more toxic than old tuberculin.

The conclusion to which it is proper to come is that clinical experience must be the test. Let those who have been in the habit of using tuberculin T.R. continue with this tuberculin; let those who have learnt to manage Béraneck's tuberculin do the same, and let the others study either tuberculin B.E. or tuberculin C.L., according to whether they prefer to immunise patients against the whole of the tuberculous poisons or against the most violent of them bearing in mind that in the first case if they have the advantage of hoping for a more complete immunisation, they will have the inconvenience of working with bacilli which are simply crushed (which gives no great idea of safety); while in the second case, if they only immunise against one of the tuberculous poisons, they have at least certain knowledge that the fluid they inject only contains chemical substances. And when, on all hands, patients have been cured with tuberculins, it will be possible to compare the results from the point of view of the rapidity and permanence of the cure.

To obtain tuberculins T.R. or B.E., simply write to Messrs. Meister, Lucius, and Brünig at Höchst-am-Main. The cubic centimetre of tuberculin T.R. costs twelve francs, and of B.E. about two francs.

Béraneck's tuberculin may be obtained by writing to M. Béraneck at Neufchâtel (Switzerland), and Calmette's by writing to M. Calmette, director of the Pasteur Institute, at Lille. Tuberculin T.B.K. is sold in fifteen solutions. Each solution costs three francs. Tuberculin C.L. is sold in "*ampoules*" by the firm of Poulenc. Explanatory literature, sent out with each of these tuberculins, details the way to use it.

Tuberculin therapy, according to the new method started by von Hippel, ought to consist in accustoming the organism to progressively increasing doses of tuberculin without producing at any time any local or general reaction. Therefore, it is necessary to take the temperature of patients at least twice a day, and to stop as soon as one sees reaction in the affected organ, which is a very easy matter where ocular tuberculosis is concerned. Strong doses of tuberculin should eventually be reached, but to begin with, according to Calmette, only a ten-thousandth of a milligramme should be used, according to Koch, two-and-a-half millionths of a milligramme, according to Béraneck, about one-millionth. But if there seem to be great differences between these data, in practice one rapidly reaches the point, in a great many cases, of employing tuberculin B.E. and tuberculin T.B.K. in the dose of a ten-thousandth of a milligramme, like that of Calmette. It is therefore probable that the extremely toxic product in these three tuberculins is the same.

As to tuberculin T.R., its method of preparation must weaken it a little, since it is advised to begin with $\frac{1}{5000}$ milligramme.

Finally, let us remember that at Berlin experiments are also going on with Behring's tulase and anti-tulase.

It is a regrettable fact that the study of variations of the opsonic index is so complicated, because the most scientific way of studying tuberculin therapy would be that which is guided by the index findings. These have to be replaced by many questions to patients as to their sensations, and the dose must be reduced when appetite, sleep, or any other function seems defective in spite of the fact that there is no rise of temperature. Tolerance of the poison ought to be brought about without the patient being aware of anything except the diminution of all his troubles. One should go ahead slowly and patiently, and yet should eventually reach strong doses. That is a condition necessary for a permanent cure, according to the majority of authors. A small minority allows that the same result can be obtained with weak doses long continued.

ERNEST THOMSON.

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(24) **Wolfrum.**—*Arch. f. Augenheilkunde*, LIV, S. 1, 1906.
(25) **Brückner.** - *Arch. f. Augenheilkunde*, LVI, S. 352, 1906.
(26) **Darier.**—*La Clinique Ophtal.*, p. 331, 1906.
(27) **Rohmer.**—*Soc. Méd. de Nancy*, 16 mars, 1906.
(28) **Török.** *Zeitschrift f. Aug.*, XVI, S. 56 and *Szemeszet*, No. 5, 1906.
(29) **Diem.**—*Thèse de Zurich*, 1906.
(30) **Koster.**—*Nederland Tijdschr. v. Geneesk.*, 188, 1906.
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(32) **Capolongo.**—*Ann. d'ottal*, XXXV, S. 933, 1906.
(33) **Krstitch.**—*Thèse de Nancy*, 1907.
(34) **Török.** *Arch. of Ophthalmology*, Sept., 1907.
(35) **Bull.**—*Journal of Amer. Med. Assn.*, Aug., 1907.
(36) **Erdmann.**—*Münch. med. Woch.*, 2 Aug., 1907.
(37) **Herford.** *Berlin Ophthal. Gesell.*, 16 Mai, 1907.
(38) **Snell.**—*Trans. Opt. Soc. U.K.*, 1907.
(39) **Hancock and Mayou.**—THE OPHTHALMOSCOPE, July, 1907.
(40) **Stock.**—*Arch. f. Ophthal*, LXVI, p 1, 1907.
(41) **Sahli.**—*Corresp -bl. f. Schw. Aertz.*, 1907.
(42) **Alessandro.**—*La Clinique Ophtal.*, Feb. 1908.
(43) **Kraemer.**—*Die Ophthalm. Klinik*, 1908.
(44) **Rohmer.**—*Soc. franç. d'Oph.*, T. XXV, p. 334, 1908.
(45) **Davids.**—*Arch. f. Oph*, LXIX., Hft. 2, S. 231, 3 Nov., 1908.
(46) **Collin.**—34 *Versam. der Ophth. Gesell.*
(47) *Soc. franç. d'oph.*, 1907.
(48) **Auclair and Paris.** *Arch. de Méd. Expér.*, 1908.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—THE PUPIL.

(1) **Schreiber, L.—New observations on the reflex of the pupil after resection of the optic nerve in the rabbit.** (Neue Beobachtungen ueber Pupillenreflexe nach Sehnerven durch schneidung beim Kaninchen.) v. Graefe's *Archiv für Ophthalmologie*, Bd. LXI, Heft 3.

(2) **Breuil.—A contribution to the study of pathological hippus and of see-saw pupil.** (Contribution à l'étude de l'hippus pathologique et de la pupille à bascule.) *L'Ophtalmologie Provinciale*, T. III, p. 186, mars, 1907.

(3) **Hirschberg, J.—A case of unilateral Argyll Robertson reaction following a peripheral injury to the oculo-motor nerve.** (Ein Fall von einseitiger reflektorischer Pupillenstarre bei Vorhandensein der Konvergenzreaktion infolge von peripherer Okulomotorius Lähmung nach Eindringen eines Eisensplitters in die Orbita.) *Centralbl. für prak. Augenheilk.*, Juli, 1907.

(4) **Cornwell, Herbert C. de V.—The pupil in extra-ocular disease.** *American Medicine*, October, 1908.

(5) **Hesse, Robert.—Investigation of the hemiopic pupillary reaction and the extent of the pupillo-motor region of the retina.** (Studien ueber die hemiopische Pupillenreaktion und die Ausdehnung des pupillomotorischen Bezirks der Netzhaut.) *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1909.

(6) **Gautrelet, J.—Adrenaline as a test of lesions of the ocular sympathetic.** (L'adrénaline, réactif des lesions du sympathique oculaire.) *Archives d'Ophtalmologie*, avril, 1909.

(1) Marenghi thought he could elicit reaction of the pupil to light after intracranial resection of the optic nerve and ascribed this to a hitherto unknown intraocular reflex centre. Abelsdorff could not verify his results, and **Schreiber** now proceeds to explain the cause of error in Marenghi's experiments, which, had they proved correct, would have led to a complete revision of the present conception of the subject. Schreiber finds that after resection of the optic nerve, the pupil, although perfectly rigid to light, can be made to contract by strongly grasping the root of the ears, and that this contraction again gives way to dilatation if the abdomen of the rabbit is struck several times in succession. He is at present unable further to locate the reflex, but is sure it is in no way connected with light. R. GRUBER.

(2) In a previous communication (*Archives d'Ophtalmologie*, février, 1906), **Breuil,** in conjunction with Aurand, proposed the following classification of the various forms of hippus:— 1. Hippus from hyperexcitability of the nervous centres: 2. Hippus in connection with the respiratory act; 3. Hippus occurring in paralyses undergoing cure; 4. Rhythmic hippus. He now proposes to add reflex hippus to the subdivisions of Class 1, and quotes a case in which the pupillary symptom occurred in association with

otitis. He also proposes to change the name of Class 2 to "hippus in connection with circulatory disturbance," as the respiratory troubles act by causing changes in blood-pressure. Finally, he gives a translation of the history of a case recorded by Geronne,* in which mitral stenosis, with diminution in the size of the left ventricle and increase in the size of the left auricle and ventricle, was found *post-mortem*. In addition to the usual symptoms associated with these lesions, the left pupil was usually larger than the right, and there was slight left exophthalmos with sweating of the left side of the face and brow; but when the patient lay on her right side, the right pupil became the larger and the sweating of the left side of the face ceased. It is suggested that the condition was due to one of the following causes :— 1. mechanical irritation of the sympathetic by the hypertrophied heart; 2. a reflex from the cardiac branches of the sympathetic stretched by the cardiac dilatation; 3. mechanical action from circulatory disturbance.

R. J. COULTER.

(3) In this case a healthy young man had a piece of steel driven into his left orbit through the lower lid. **Hirschberg** (Berlin) successfully removed this with a magnet. The wound healed perfectly, and the movements gradually returned except outwards, and the curious Argyll Robertson reaction was then noticed. There was no reaction to light,either direct or consensual, but a prompt reaction to convergence. The reaction of the right eye was normal. In view of this case it is impossible to maintain the statement that unilateral Argyll Robertson pupil must have a cerebral cause. A. LEVY.

(4) **Cornwell's** article constitutes a *résumé* of well-known pupil signs.

(5) Before approaching the question of the practical value of the hemiopic pupillary reaction, it seemed imperative to make sure of the physiological foundation of the test. Hess, indeed, had, on the ground of careful investigation, come to the conclusion that only a limited central region of the retina, not more than four millimeters in diameter, was reflex-sensitive. **Hesse**, adopting largely the methods of Hess, carried out a long series of intricate experiments. From these, as well as from the examination of suitable clinical cases, he derived the following results : the periphery of the retina, up to, at least, 45 or 50 degrees, is also reflex-sensitive. However, the peripheral reflex cannot be put to a practical purpose on account of the incomparably greater sensibility of the retinal centre, coupled with the difficulty of protecting the latter from diffused light in stimulating peripheral parts of the retina. Hesse overcame this obstacle by the ingenious method of dulling the reflex-sensibility of the retinal centre by exposing it to the glare of a strong light. A stimulus not strong enough under these circumstances to excite the centre of the retina, elicits a pupillary reaction from the periphery. Hesse agrees with Hess that in the light-reflex of the pupils, the retinal cones form the receptive organs, and he thinks it, *á priori*, unlikely that the peripheral cones should differ in this respect from the central group. C. MARKUS.

(6) Adrenaline, applied to the eye of any animal except the frog, which is peculiarly susceptible to the agent, produces no marked effect upon the pupil. Meltzer (1904) who knew this fact, removed the superior cervical ganglion of the sympathetic, and twenty-four hours after the operation on the rabbit and twenty hours after in the cat, found that adrenaline, applied to the eye, produced marked mydriasis. In the normal eye of man adrenaline produces no pupillary reaction. But **Gautrelet** (Bordeaux) points out that in cases of paralytic myosis, adrenaline, when dropped into the eye, causes more or less dilatation of the pupil. SYDNEY STEPHENSON.

Zeitschr. f. klin. Medicin, 55 and 60, pp. 377, etc., 1906.

II.—THE ÆTIOLOGY OF PHLYCTENULAR AFFECTIONS. OF THE EYE.

Weekers, L.—The exanthem of phlyctenular conjunctivitis regarded as a toxi-tuberculide. (L'Exanthéme de la conjonctivite phlycténulaire envisagé comme une toxi-tuberculide.) *Archives d'Ophtalmologie*, mai, 1909.

The pathogeny of phlyctenular affections of the eye still remains an obscure chapter of ophthalmology, despite the frequency of the conditions. Bach and Smith have insisted upon the importance of the staphylococcus; Knies and others, upon the intimate relationship between phlyctenular conditions and certain affections of the nose; and Herz and Goldenburg, among others, upon pediculi capitis as an ætiological factor. All writers agree upon one point, namely, that scrofulosis plays an important part in the ætiology. Amongst children suffering from phlyctenular disease, A. von Graefe found that 25 per cent. were scrofulous, while the proportion was given as 63 per cent. by Hirschberg and 80 per cent. by Axenfeld. But the term "scrofula" is now a little out-of-date, more especially since it has become more or less widely recognised that most so-called scrofulous affections are, in reality, of tuberculous nature. Straub (Graefe's *Archiv.*, 1905), however, still maintains the clinical conception of scrofula, which he looks upon as a dyscrasia proceeding from a torpid tuberculosis. A family history of tuberculosis is common enough among tuberculous subjects. Nias and Paton's observations upon the opsonic index for tubercle bacilli confirm the view that tuberculosis is often present in the cases. Carlotti obtained positive results from the ophthalmo-reaction in four cases of phlyctenular kerato-conjunctivitis.

Weekers, of Liège, has been struck by the analogies between the eruption of phlyctenular kerato-conjunctivitis, on the one hand, and certain toxi-tuberculides of the skin, on the other. Dermatologists, as he points out, now distinguish between two kinds of lesion in cutaneous tuberculosis: (1) cutaneous tuberculosis properly so-called, which contains the tubercle bacillus, and which can be successfully inoculated into the guinea pig; and (2) toxi-tuberculides, represented by lichen scrofulosorum,* which contain no specific bacilli, and which, when inoculated into animals, yield a negative result. On this view, toxi-tuberculides are due to the irritating action of tuberculous toxins fabricated by some tuberculous *foyer*, thrown into the circulation, and then carried endogenously to the conjunctiva. Certain facts tell in favour of Weekers' theory. Thus, conjunctival phlyctenulæ sometimes make their appearance in tuberculous subjects who are being treated by tuberculin; and, again, everybody has seen phlyctenulæ appear as a complication of the ophthalmo-reaction, which, after all, is only the contact of tuberculin with the conjunctiva. To Weekers' mind, the phlyctenulæ which appear as a complication of the ophthalmo-reaction are to be regarded as experimental toxi-tuberculides.

Weekers experimentally confirmed the frequency of tuberculosis amongst children affected with phlyctenular affections of the eye, adopting for the purpose the cuti-reaction, as being at once the easiest, least dangerous, and most convenient method at his disposal. The skin was scarified by the instrument devised by v. Pirquet, and Koch's old tuberculin, diluted one quarter, was used. Among 58 children a positive result followed the vaccination in 51. Clinical observation is thus confirmed by experimental evidence, and that phlyctenular diseases often develop upon a tuberculous soil is rendered certain.

SYDNEY STEPHENSON.

* The reviewer has notes of several cases where phlyctenulæ coincided with lichen scrofulosorum.

III.—TRACHOMA BODIES.

Greeff, R.—More about our trachoma discoveries. (Weiteres über unsere Trachombefunde.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1908. Volume published in 1909, p. 100.

Greeff (Berlin) confirms his previous discoveries with regard to the small granules which he called "double-granules" (*Dopplekörnchen*) and later "trachoma corpuscles" (*Trachomkorperchen*). The first name refers to their tendency to lie in pairs side by side, the second emphasizes the fact that they are constantly to be detected in every case of fresh untreated trachoma. Greeff confesses that other workers have not confirmed his results; but this failure, he thinks, is due to faulty *technique* and to lack of experience on the part of his critics.

The corpuscles are smaller than the smallest cocci known, but not so minute as the tiny granules which are ubiquitous in every preparation. They stain deeply with Giemsa, and fainter with aniline dyes. They are surrounded by a distinct bright areola. They are not to be confused with eosinophil granules, as we see them in leucocytes, which do not possess all these characteristics. In late stages of the disease they form large aggregations, mostly intra-cellular, the so-called "*Haufen*" form. In such cases the twin formation and the areola are not easily distinguished.

These structures were first found in the follicles, both free and intracellular; then in the epithelium, where they were first described by Halberstädter and v. Prowazek; and, finally, in the viscous secretion. They are difficult to see and to find, and long practice is necessary. There is, however, not the remotest doubt that they are regularly present in all "suitable" cases of trachoma.

Greeff admits that Halberstädter and v. Prowazek, working in Java at the same time that he himself was searching for the cause of trachoma, discovered the same bodies independently.

Discussion.

Erdmann (Rostock) found very similar corpuscles in cases of chronic conjunctivitis and vernal catarrh, which were certainly not trachomatous. But now, by following Greeff's methods, he finds them more frequently in trachoma.

Römer (Greifswald) had been unable to utilize the presence or absence of the corpuscles as an aid to diagnosis. T. HARRISON BUTLER.

IV.—HERPES ZOSTER.

(1) **Galezowski, J. and Beauvois, A.—Paralysis of the sixth nerve and Tenonitis in zona ophthalmicus. (Paralysis de la sixième paire et ténonite dans le zona ophtalmique.)** *Recueil d'Ophtalmologie*, novembre, 1906.

(2) **Ginestous.—Infantile ophthalmic herpes.** Reported in *Annales de Médicine et Chirurgie Infantiles*, 15 octobre, 1907.

(1) **Galezowski** and **Beauvois** report two cases of paralysis of the sixth nerve in zona ophthalmicus.

In one case it was associated with slight iritis, and in the other with scleritis, Tenonitis, and keratitis neuroparalytica.

Both patients were of an advanced age (75 and 82 years) and the ocular symptoms gradually abated as the skin lesion got better. The complicated lesions of the second case were regarded as having been produced by a pneumococcic infection. The paralysis of the sixth nerve was taken to be due to extension of the neuritis of the fifth nerve along the fibres communicating between that nerve and the sixth in the cavernous sinus.

In many cases the development of zona in the aged is a sign of impending mental breakdown, but, so far, the cases recorded have not developed any signs of a cerebral lesion. J. JAMESON EVANS.

(2) **Ginestous** reported to the *Sociéte d'Anatomie de Bordeaux* a case of ophthalmic herpes in a child of eight years. The child had previously suffered from phlyctenular conjunctivitis for two years, and had recently had some sand projected into the eye by another child. The eruption did not affect the eyeball, but only the frontal, nasal, and eyelid regions.

ERNEST THOMSON.

V.—TRYPANOSOMIASIS AND AFFECTIONS OF THE EYE.

Morax.—Ocular manifestations in human trypanosomiasis. (Manifestations oculaires dans la trypanosomiase humaine.) *Ann. d'Oculistique*, T. CXL, p. 39, juillet, 1908.

Morax (Paris), following up a former article * in which he referred to some instances of human trypanosomiasis associated with ocular disease, records a further case in which an attack of iritis and an attack of cyclitis, both of them mild, occurred during the first year after infection with trypanosomiasis. He also quotes the histories of two other cases—one, recorded by Nattan-Larrier and Monthus, in which the patient had three attacks of iritis during the first year after infection with trypanosomiasis; and the other, recorded by Wurz and Nattan-Larrier, in which the patient, an old syphilitic, had an attack of iritis and an attack of cyclitis also during the first year after infection with trypanosomiasis. These are the only fresh cases the author has been able to find in medical literature. Although the nature of these attacks has not yet been demonstrated anatomically, Morax considers that from their symptoms, from their unilaterality, and from the analogies between them and the ocular manifestations observed in animals infected with different varieties of trypanosomes, there is a strong presumption that they are due to sudden proliferation of trypanosomes in the tissue of the iris or ciliary body, and that this is strengthened by the fact that they have often coincided with febrile attacks and the recognition of trypanosomes in the blood. Apart from this rarity, the chief characteristic of these ocular manifestations of trypanosomiasis would seem to be their mild character. R. J. COULTER.

VI.—CONGENITAL FACIAL PARALYSIS AND OPHTHALMOPLEGIA.

Babonneix, L., and Harvier, P.—Congenital unilateral facial paralysis and bilateral ophthalmoplegia externa. (Paralysis faciale unilatérale et ophtalmoplégie externe bi-latérale congénitales.) *Gazette des Hôpitaux*, 5 novembre, 1908.

Babonneix and **Harvier** relate and illustrate an interesting case of

* *Ann. d'Oculistique*, T. CXXXVI, p. 437, décembre, 1906.

congenital facial and ocular paralysis. The child was one year old when seen, and had been born at term of healthy parents. There had been no difficulty at birth, no instruments were used, and labour was completed in two hours, according to the mother, a primipara. The mother presented a slight divergent squint. Soon after the child's birth, deviation of the mouth and double-sided convergent squint had been noticed. The child was found by the authors to have left facial paralysis of peripheral type—complete galvanic and Faradic inexcitability of the facial nerve—incomplete external bilateral ophthalmoplegia, and atrophic choroiditis, with absence of retinal pigment. The eye muscles involved were the external recti and both obliques on each side. The authors, in view of the electrical condition of the seventh nerve, regard the whole affection as nuclear. They assume that there was a failure of grey matter on the left side extending from the eminentia teres to the posterior end of the nucleus of the third nerve, and on the right side localised to the nuclei of the sixth, fourth, and neighbouring part of the third nerves. The atrophic choroiditis and absence of retinal pigment they regard as undoubtedly congenital; but they admit that they are open to conviction as to their interpretation of the case by its evolution in the future. A useful short list of references is given. ERNEST THOMSON.

VII.—NEURO-FIBROMATOSIS.

Michel, J. von.—On changes in the eye and its annexa in congenital neuro-fibroma of the skin of the face. (Ueber Veränderungen des Auges und seiner Adnexa bei angeborenem Neuro-fibroma der Gesichtshaut.) *Bericht der Ophthalmologischen Gasellschaft*, Heidelberg, 1908. Volume published in 1909, p. 6.

von Michel (Berlin) has had the opportunity of examining a large number of cases of neuro-fibromata of the face associated with changes in the eye and especially with buphthalmos. The association of this condition with unilateral hypertrophy of the tissues of the face is so frequent that buphthalmos must be considered to be a symptom of the condition. The disease appears in three forms: 1. a general unilateral facial hypertrophy; 2. fibroma molluscum; and 3. plexiform neuroma. All are characterised by an overgrowth of the perineurium and endoneurium of the cutaneous nerves, which forms knots and cords which can be felt in the skin, the nodes reaching the size of a cherry, and the cords that of a lead pencil. Often a kind of elephantiasis results. The facial hypertrophy may be confined to the soft parts or may attack the bones as well. The tongue and mouth may also participate in the disease. Sometimes the upper lid on one side is the only part affected. von Michel agrees with Cagiati in regarding the disease as a deformity starting in early fœtal life, a morbid change in the whole mesenchyma. The connective tissue growths on the nerves form only part of a general disturbance. The ciliary nerves are often diseased, and this may have some influence upon the production of buphthalmos. von Michel regards the two defects as but parallel results of a general hypertrophy of the mesenchyma, and thinks that the high tension is produced by fibromatous changes at the filtration angle.

Discussion.

Seefelder in an eye which he examined from a patient suffering from neuro-fibromata, found changes in the ligamentum pectinatum, but they were

not fibromatous in nature. They consisted in the abnormal persistence of tissue which is a normal fœtal constituent of the pectinate ligament. The ligament examined was analogous to that of many full-grown mammals, pigs, cats, etc., and so the hydrophthalmus could be regarded as atavistic in nature. Virchow called this tissue "*Uveal Gerüstwerk*"—uveal scaffolding.

T. HARRISON BUTLER.

VIII.—JAW-WINKING MOVEMENTS.

(1) **Sym, W. G.—A case of partial ptosis with exaggerated involuntary movement of the affected eyelid. The jaw-winking phenomenon.** *Ophthalmic Review*, July 1908.

(2) **Lint, A. van.—Movements of the upper eyelid associated with movements of mastication. (Mouvements de la paupière supérieure associés aux mouvements de la mastication.)** *Bull. de la Société Belge d'Ophtalmologie*, No. 25, 1908, p. 54.

(3) **Cantonnet, A.—Involuntary movements of elevation of the lid associated with those of the jaw and face. (Mouvements involuntaires d'élévation palpébrale associés à ceux de la machoire et de la face.)** *Archives d'Ophtalmologie*, avril, 1909.

(1) **Sym** (Edinburgh) reports the case of a patient, a woman aged 30, who when at rest, appeared to have partial ptosis of the left upper lid. The elevator was by no means paralysed, for when she opened her mouth in eating, and being musical, when singing also, the left upper lid became elevated, disclosing as much as 3 mm. of white sclerotic above the corneo-scleral junction and this was particularly marked when she depressed the jaw suddenly. No other unusual features about the eyes or lids were apparent. Other recorded cases are referred to, and various theories are given which different observers have held to account for the curious condition, which naturally admits of no treatment. C. DEVEREUX MARSHALL.

(2) **van Lint's** (Brussels) patient was a small girl, aged 5 years, whose left upper eyelid became raised whenever the lower jaw was depressed. There was no ptosis. H. COPPEZ.

(3) Basing his remarks upon the case of a young man who developed ptosis of the left upper lid, diplopia, and ? left facial paralysis the day after a tooth had been extracted, **Cantonnet** (Paris) discusses cases where movements of the eyelids are associated with those of the jaw or of the face. In his own case the affected eyelid became elevated when the lower jaw was depressed. So marked was the appearance that the patient, a baker's apprentice, became a laughing-stock to his comrades. SYDNEY STEPHENSON.

IX.—SEXUAL ORGANS AND AFFECTIONS OF THE EYE.

Lloyd-Owen, D. C.—The influence of the sexual organs on affections of the eye in women. *Birmingham Medical Review*, February, 1909.

The principal text of **Lloyd-Owen's** interesting Middlemore Post-Graduate Lecture for 1908 is that auto-intoxication explains a great deal of what Jonathan Hutchinson called the "profound and mysterious" in

connection with the relation of ocular diseases to disturbances of the sexual organs in women. It is certain that the proportion of eye troubles is much greater in the female than in the male. The author takes up in succession menstruation and puberty, the menopause, derangements and disease of the uterus, pregnancy, and lactation; and, while giving due weight to various theories as to th : relation between the diseases of one set of organs and the other, explains most of them as being due to auto-intoxication. A great deal of ground is covered in this excellent lecture, and while, in some places, the ground is perhaps not quite firm owing to insufficiency of facts, in others, such as the renal changes of pregnancy and their ocular manifestations, it gives a good foundation for the elaboration of the theory of auto-intoxication.

ERNEST THOMSON.

X.—THE EYE AND THE NERVOUS SYSTEM.

(1) **Bieth, A.—On some forms of atrophy and of optic neuritis of unusual origin, or difficult to recognise.** *Annali di Ottalmologia*, Vol. XXXVI, (1907), fasc. 6-8, p. 551 to 584 and fasc. 9-11, p. 670-712.

(2) **Williamson, R. T. — Disseminated sclerosis, commencing with failure of vision.** *Lancet*, May 2nd, 1908.

(3) **Tyson, H. H., and Clark, L. Pierce.—The eye syndrome of dementia præcox. Preliminary report of ocular signs and symptoms of dementia præcox and their significance, as observed in 115 consecutive cases.** *Journal American Medical Association*, May 2nd, 1908.

(4) **Wernicke, Otto.—Tabes and syphilis.** (Tabes und Syphilis.) *Centralbl. f. prak. Augenheilk.*, Mai, 1908.

(5) **Holden, Ward A.—The optic nerve changes in multiple sclerosis.** *Journal American Medical Association*, 11th July, 1908.

(6) **Taylor, James.—A clinical lecture on visual and ocular defects associated with general disease.** *Medical Press and Circular*, 12th August, 1908.

(7) **Rodier, Pansier, and Cans.—The ocular manifestations of epilepsy.** (Les manifestations oculaires de l'épilepsie.) *Annales d'Oculistique*, T. CXL, p. 241, octobre, 1908.

(8) **Cosmettatos.—Bilateral metastatic ophthalmia following epidemic cerebro-spinal meningitis.** (Ophtalmie métastatique bilatérale à la suite de méningite cérebro-spinale épidémique.) *Annales d'Oculistique*, T. CXL, p. 276, octobre, 1908.

(9) **Barbonnex, L., and Tixier, L.—Optic atrophy in meningeal affections of early infancy.** (Atrophie optique dans les affections méningées de la première enfance.) *Annales de Médecine et Chirurgie Infantiles*, 15 décembre, 1908

(10) **Terrien, F., and Bourdier.—The immediate ocular disturbances observed in the course of an epidemic of cerebro-spinal meningitis.** (Les troubles oculaires immédiats dans l'épidemie actuelle de méningite cérébro-spinale.) *Archives d'Ophtalmologie*, mai, 1909,

(1) Of the clinical observations related by **Bieth** (Padua), the first is a case of amblyopia due to ankylostomiasis (very advanced amblyopia,

ophthalmoscopic appearances and dyschromatopsia as in alcohol-tobacco amblyopia, very slow improvement under treatment). Then follows an interesting *résumé* of the ocular lesions reported by different authors as associated with ankylostoma in the duodenum, and of the hæmatological and nutritional disturbances which the parasite causes. The second observation concerns a double papillitis in a case of purpura hæmorrhagica in a tuberculous boy, aged nine, and the author reviews the work already done on affections of the optic nerve after profuse hæmorrhages, in Werlhof's disease, following hæmatemesis, etc. In the third observation there is a doubtful diagnosis of unilateral tuberculosis of the optic nerve (little yellowish-white nodules quite close to the edge of the disc, visible on ophthalmoscopic examination). The last two cases are cases of bilateral retrobulbar neuritis, probably an early and isolated symptom of disseminated sclerosis. A bibliography containing 133 references is appended to Bieth's work, which is a very instructive one. A. ANTONELLI.

(2) **Williamson,** of Manchester, points out that it is not only in tabes that optic atrophy may be one of the earliest signs. In disseminated sclerosis visual failure, from changes in the optic nerve or chiasma, may be the first symptom of the disease. "In the form of disseminated sclerosis beginning with visual failure, pain and anæsthesia are very rare. The signs of chief diagnostic value at the early stage are: (1) unilateral or bilateral visual failure with central scotoma in some cases and often with pallor of the optic disc, especially of the temporal half, (2) the Babinsky type of plantar reflex on one or both sides, (3) the irregular or shaky character of the handwriting, even when the tremor is so slight that it can hardly be detected (a most valuable sign), (4) the age of the patient, under 40 years. The absence of any cause for the affection and of any history of syphilis, the absence of pain and anæsthesia, and the presence of the knee-jerks, tendo Achillis reflexes, and pupillary reflexes, are points of diagnostic value in favour of disseminated sclerosis. It is interesting to note that in many cases after the visual defect has become marked, there is a decided improvement or almost complete recovery of vision. In other cases the visual defect remains more or less stationary, and when it does progress it very rarely advances to complete blindness, in this respect differing from the optic atrophy of tabes dorsalis." ERNEST THOMSON.

(3) The clinical significance of the findings of these authors is of importance as they indicate that dementia præcox is attended by such early and constant ocular syndromes as to aid materially in the diagnosis of the psychosis. The syndromes are a distinct contribution to the theory that dementia præcox is an autotoxic disease, and that the poison, primarily vascular, finally induces neuronic degeneration. They are of prognostic value, as the severer grades of eye changes are found in the more rapidly deteriorating cases. The optic nerve lesions are quite in accord with our best knowledge of the pathologic anatomy of the condition in tracts of the brain other than the optic nerve (which may be counted as an analogue).
C. A. OLIVER.

(4) The relationship of syphilis to tabes and of syphilitic and tabetic eye disease to the development of general tabes has been much discussed, and **Wernicke** (Buenos Ayres) now sets up another relationship which he desires to be tested at the great nerve clinics; it is that "syphilitics who have suffered from syphilitic iritis never become tabetic." A possible explanation of this fact (if fact it be) may possibly lie in the different embryonal layers affected. If the post-syphilitic disease affect the ectodermal layer, there is a tendency for the mesodermal layer to escape, and *vice versâ*. A. LEVY.

(5) **Holden** (New York City) has found that visual disturbances are present

in about one-half of the cases of multiple sclerosis. Dimness of vision is generally noticed early in the course of the disease, even appearing long before any other clinical expression : the occurrence of central scotomata in more than a half of these cases often gives rise to an ophthalmologic diagnosis of retrobulbar neuritis. In the author's opinion, we shall soon come to the belief than a non-toxic type of retrobulbar neuritis, if not due to a sinusitis or if not directly dependent upon diabetes, syphilis, a neoplasm, or trauma, is, as a rule, a manifestation of multiple sclerosis, although no other sign or symptom of the disease be present. CHARLES A. OLIVER.

(6) **Taylor's** most interesting lecture, which one can well imagine would be listened to with closest attention, covers a very wide field in comparatively few words, but it hardly lends itself to abstract in THE OPHTHALMOSCOPE. As a summary of the subject, it may well be read in the original.

ERNEST THOMSON.

(7) **Rodier, Pansier,** and **Cans** have examined the eyes of 50 epileptics, and find that the following conditions are usually present.—1. Immediately before the fits, mydriasis, ischæmia of the retina, followed by hyperæmia and amblyopia, and often accompanied by hallucinations. 2. During the fits, injection of the conjunctiva with anæsthesia or hyperæsthesia, mydriasis, absence of pupillary reflexes, congestion of the disc, with enlargement and tortuosity of the retinal veins. 3. Immediately after the fits, slight contraction or normal size of the pupils, with sluggish reaction, hyperæmia of the fundus, lasting from a few minutes to 12 hours according to the severity of the fit, and amblyopia. 4. In the intervals between the fits, slight mydriasis (pupils 4 mm. and over) and irregular contraction of the field of vision, with at times more or less advanced atrophy of the optic nerves, and almost always a peculiar choroidal pigmentation suggestive of hereditary syphilis as a cause of the epilepsy,

R. J. COULTER.

(8) **Cosmettatos** (Athens) records the case of a patient, aged 28, who lost the sight of both eyes from non-suppurative ophthalmia during an attack of cerebro-spinal meningitis. R. J. COULTER.

(9) The interesting point in the cases of **Barbonnex** and **Tixier** is the youth of the patients. Three cases are reported in which bilateral optic atrophy was observed in association with meningitis. The first was aged five months, and suffered from cerebro-spinal meningitis. R.E., old iridochoroiditis with synechiæ, media cloudy, and fundus invisible. L.E., grey optic atrophy, which appeared to be consecutive to optic neuritis. *Post-mortem* : interstitial œdema of optic nerves. The second child was aged four months ; meningitis and broncho-pneumonia, white atrophy of both optic nerves. *Post-mortem* not obtainable. The third was an infant of 18 days ; meningitis or meningeal hæmorrhage. Both discs grey and apparently atrophic. No sign of recent or old neuritis. This child recovered. The authors point out that blindness is well-known to be a complication of various meningitic lesions in the adult and in older children, but that such cases as they have here recorded in sucklings are uncommon. ERNEST THOMSON.

(10) **Terrien** (Paris) and **Bourdier** (Paris) report upon the immediate eye complications observed by them in 42 cases of epidemic cerebo-spinal meningitis. The complications included.—1. Six cases of conjunctivitis with discharge, associated with several micro-organisms, but more especially with an intra-cellular diplococcus, negative to Gram. Whether this organism was the meningococcus remains uncertain so far. 2. Two cases of ulceration of the cornea of a type surmised by the authors possibly to represent an attenuated neuro-paralytic syndrome. 3. Twenty-four cases of mydriasis observed during meningitic coma, during the period of resolution, or during

convalescence. 4. Five cases of myosis, observed during periods of meningeal excitation. 5. One case of Argyll Robertson pupil. 6. Eight cases of paralysis of extrinsic muscles of the eye (almost always of a transitory nature), including two instances of paralysis of convergence observed during convalescence. 7. Seven cases of neuro-retinal congestion and three cases of neuro-retinitis. 8. Sixteen cases of papillitis. With regard to the last *item*, seven cases were observed on the fourth day of the illness, two on the sixth, the eighth, and the fourteenth day respectively, and one case on the tenth, eleventh, and nineteenth day respectively. Terrien and Bourdier conclude that double optic neuritis is the commonest ocular complication of epidemic cerebro-spinal meningitis, especially at the beginning. The affection, however, appears to interfere but little with the acuity of vision. Photophobia, common in tuberculous meningitis, has never been seen by the authors in cerebro-spinal meningitis. Irido-choroiditis, stated by Schmidt-Rimpler and Gowers to be the commonest complication, was never observed, nor was metastatic suppurative panophthalmitis, stated by Uhthoff to occur in from 4 per cent. to 5 per cent. of the cases. Post-papillitic atrophy (common according to Heine) was not met with. Finally, Terrien and Bourdier comment upon the good effect produced on eye complications by the serum treatment of cerebro-spinal meningitis, as now carried out in all the Paris hospitals. SYDNEY STEPHENSON.

XI.—EMBOLISM AND THROMBOSIS.

(1) **Hancock, W. Ilbert.—Certain changes in regard to the field and fundus changes in obstruction of the central artery of the retina.** *Royal London Ophthalmic Hospital Reports*, Vol. XVII, Pt. III.

(2) **Duyse, van.—Obstruction of the central artery of the retina: pressure-massage: cure. (Obstruction de l'artère centrale de la rétine: massage-pression: guérison.)** *Archives d'Ophtalmologie*, mars, 1908.

(3) **Ridley, N. C.—A case of thrombosis of the central artery of the retina.** *Ophthalmic Review*, August, 1908.

(4) **de Schweinitz, G. E. and Holloway T. B.—Sudden obstruction of the central artery of the retina, being a clinical record of five cases.** *Transactions American Ophthalmological Society*, 1908.

(1) Two cases are first of all cited: a lady of 73 and a man aged 63, both of whom presented the typical appearance of obstruction in the main trunk of the central artery of the retina. In neither case was any abnormal retinal vessel visible, and yet in both there was some preservation of the temporal part of the field of vision.

In the literature of the subject, **Hancock** (London) finds records of 15 similar cases. Nine similar cases were put at his disposal by Nettleship, in which some vision was preserved, generally amounting to counting fingers in the temporal field in every case.

Out of a total of 25 cases, the vision which remained was present in the temporal part in 20 of the cases, and in most of the others it was present at this part and some other part also.

The two main points to be determined are: (1) If the obstruction is complete, why is any field at all left? and (2) why is the preserved portion so frequently on the temporal side and at the extreme periphery? In answer to

the first question, Hancock sees reason for believing that the extreme periphery of the retina is to a certain extent nourished from the choroido-capillaris, as is the entire retina in some of the lower animals. As regards the second question, he points out that the nasal peripheral retina is the most functionally active, and here the retina extends more forward than elsewhere. Hence, vision is more likely to be preserved here than elsewhere.

As regards the nature of the retinal opacity observed after obstruction of the central artery, this is often spoken of as œdema, but Hancock doubts if this is the cause of it, and he thinks it is more likely to be produced by a necrosis of the superficial retinal layers, and possibly to that form of death to which Cohnheim gave the name, "coagulative necrosis." No case has yet been examined microscopically sufficiently early to prove or to refute the suggestion. He then states various arguments and cites various opinions for and against the two theories. C. DEVEREUX MARSHALL.

(2) The case of obstruction of the central artery of the retina, cured by pressure-massage, reported by **van Duyse**, of Ghent, is as follows.—A woman, aged 72 years, became suddenly blind in one eye without obvious cause. When seen by van Duyse one hour after the event, the flame of a candle could not be recognized with the affected eye, the pupil of which was semi-dilated and motionless to light. On the optic disc, the retinal arteries were contracted, empty of blood, and devoid of the light-streak. They recovered their calibre partly at a distance of one-third of a disc diameter from the papilla, a remark that applied also to the retinal veins. The papilla was of a greyish-red colour. In the superior temporal vein there were fragments of pale blood, alternating with dark cylinders, moving very slowly. No macular or peripapillary œdema. At some little distance from the disc, a *plaque* made up of particles, having an adamantine resplendency, could be seen in the walls of a retinal artery. General examination of the patient yielded negative results. In particular, no evidence of arterio-sclerosis was obtained from examination of the radial and temporal arteries. The affected eye was massaged, and the sight slowly returned, until fingers were seen but not counted, the face of a watch was perceived as a round white object, and so forth. Ophthalmoscopic examination then showed that the retinal arteries and veins had regained more or less of their normal calibre on the optic disc. Indeed, no difference could be made out between them and the vessels of the other eye. A dark-red clot, of which the length was about twice the width of the vessels, could be seen to occupy part of the trunk of the superior nasal artery on the disc. No retinal hæmorrhages. On the following day sight had improved to the counting of fingers, with a *plus* 6 D. the hands of a watch could be recognized, not without difficulty, and the visual field was of normal size. On the third day V. (with correction) = I. Patient, however, did not read ordinary print quite so readily with the affected eye as with the other. SYDNEY STEPHENSON.

(3) **Ridley's** patient was a man, aged 49, who five hours before he was examined suddenly found that he could not see with the right eye, which was previously a good one. The right pupil was inactive directly, and only acted indirectly. R.V.=faint shadows only. L.V.=$\frac{6}{5}$. The right disc was not pale, but the arteries were reduced to mere threads, the veins were smaller than normal, and the blood they contained was broken up into beads with clear spaces between; only a gentle oscillating movement in the column took place, there being no circulation. The macula was rather redder than the rest of the fundus, but there was no cherry-red spot, and no retinal hæmorrhages. Rest and potassium iodide were prescribed.

Twenty-three days later the patient saw more light, and could count fingers at the periphery, the disc was paler, and the vessels, although still contracted, were larger than they had been ; there was then a flow of blood, with venous pulsation, while the column of blood was nowhere broken. There had been gradual improvement and V.=rather less than $\frac{3}{60}$ the disc was pale, and the vessels slightly contracted, otherwise the fundus appeared healthy. Ridley (Leicester) thinks that the obstruction was in the nature of a thrombus, which by shrinking, had allowed of partial restoration of the circulation. The patient had no cardiac lesion, but complained of being overworked and "run-down."

C. Devereux Marshall.

(4) **de Schweinitz and Holloway's** clinical report leaves nothing to be desired, whether from the ophthalmic or general standpoint. Would that we all reported our cases so carefully! At the same time the mass of detail connected with five cases, all more or less different, makes the paper difficult to summarize. Fortunately, the authors at the onset state their principal points, to which they wish to make special reference. These the reviewer takes up *seriatim*.—(1) *large central scotoma as an onset symptom, with smaller central scotoma as a permanent end product.* In dealing with this rare phenomenon they summarise the views of others (*a*) that in most cases it is due to obstruction of the macular arteries, and that in cases where this explanation does not apply in addition to obstruction of the central artery, there is (*b*) occlusion of one or more of its branches or accompanying vessels in such a manner that the central opticus-fibres are affected and a defect appears in the centre of the field of vision (Fischer) ; (*c*) or special individual susceptibility of the centre of the retina to defective nourishment (Fischer) ; (*d*) or ciliary retinal artery occlusion (Knapp) ; (*e*) or demonstrable lesion in the macula region. In their own case the authors suggest that the central vessel lesion originated an œdema which compressed the axial fibres of the optic nerve. Subsequent atrophy of these fibres took place and a smaller absolute central scotoma ultimately resulted. (2) *Extensive vasculitis and perivasculitis as the ultimate outcome of the original obstruction.* Two illustrative plates are given. (3) *Long periods of prodromal visual disturbances.* This occurred in two of the cases. The mechanism is discussed and the conclusion reached that the theory of arterial wall collapse or spasm furnishes the explanation ; (4) *The presence of a small area of functionating retina surrounding the nerve entrance, and the temporary presence of a scotoma in the visual field closely corresponding to the position of this retinal zone around the nerve head, which in some cases is ultimately the only area which retains visual perception.* The authors were fortunate in having a very intelligent patient, by whose aid they were able to chart the small area of retained vision around the blind spot which has been shown by Fischer to be typical in many cases. In another case this very region presented a temporary scotoma. It would seem possible, the authors say, that this scotoma may have been due to a temporary failure of circulation in the capillary anastomoses between the ciliary and retinal vessels, just as the preservation of circulation in these vessels accounts for the area of retained vision in other cases. (5) *The therapeutic value of deep ocular massage, and the exhibition of nitro-glycerine.* A careful examination of the literature indicates that a number of cases have been most favourably influenced by deep massage of the eyeball. In one of the patients of the present series, who was seen thirty minutes after the loss of vision, there was most complete restoration of the previously emptied arterial circulation after ten minutes of deep massage. It is quite possible (Jackson) that the good results depend upon the fact that the original obstruction was not due to embolism or thrombosis, but to arterial

collapse or spasm, but there is enough evidence (*pace* Shoemaker, who considers it irrational) to render the trial of this procedure worthy of respect. Shoemaker prefers the use of nitrites and the indication for their use is evident.

ERNEST THOMSON.

XII.—THE EYE COMPLICATIONS OF MEASLES.

(1) **Chevalier.—Double optic neuritis consecutive to measles ending in atrophy of the optic nerves. (Névrite optique bilatérale consécutive à la rougeole : terminaison par atrophie des nerfs optiques.)** *L'Ophtalmologie Provinciale*, T. IV., p. 108, octobre, 1907.

(2) **Cosmettatos, G. F.—The corneal complications of measles. (Les complications cornéennes de la rougeole.)** *Archives d'Ophtalmologie*, mai, 1908.

(1) **Chevalier** records a case of double optic neuritis accompanied by incomplete hemiplegia of the right arm and leg, following measles without aural complications, and ending in double optic atrophy. He discusses the ætiology of the condition.

R. J. COULTER

(2) To Trantas we owe the first description of a peculiar type of the corneal complications of measles (see THE OPHTHALMOSCOPE, 1904, p. 286). The changes, which generally affect both eyes, and which last from two to four days, take the form of slight cloudiness of the cornea, intermingled with which are a variable number of small spots visible with the *loupe*. In general, the deposits do not exceed half a millimetre in diameter, but deposits are sometimes present large enough to be visible to the unaided eye. Fine lines are now and then present. Trantas found the changes described by him to be present in 76 per cent. of the cases of measles. Morax, however, who attributed the lesions to fatty deposits on the surface of the cornea, met with them much less frequently. In the present communication **Cosmettatos** describes the ocular complications met with during the last epidemic of measles at Athens, where he practises. He observed twelve instances of keratitis, *viz.*, 5 of a simple, non-suppurative kind, and 7 of a more serious description. He attributes the corneal complications of measles to an endo-infection. But a careful perusal of the communication makes it clear that Cosmettatos and Trantas are describing different types of exanthematous keratitis.

SYDNEY STEPHENSON.

XIII.—THE EYE COMPLICATIONS OF VARICELLA.

(1) **Chavernac.—Double optic neuritis following varicella. (Névrite optique double suite de varicelle.)** *Ann. d'Oculistique*, T. CXL, p. 52, juillet, 1908.

(2) **Sommer, G.—Varicella and the eye. (Varizellen und Auge.)** *Wochenschrift für Therapie und Hygiene des Auges*, April 1, 1909.

(1) **Chavernac** records the case of a boy, aged 11, whose sight failed rapidly after an otherwise uncomplicated attack of varicella in February, 1905. When the patient was first seen by the author in November, 1905, in spite of previous energetic treatment with mercury, strychnine, continuous current, etc., the vision was reduced to 2/50 in each eye, there was a central scotoma

of about 4 mm. for red and green, the visual field was reduced by 20° in every direction, and there was slight optic neuritis, with some fine hæmorrhages at the edges of the discs. A series of 15 subconjunctival injections of hetol (cinammate of soda) was given, followed after three months' residence in the country on tonic treatment by another course of twelve subconjunctival injections of hetol. Under this treatment improvement was rapid, and on March 23rd, 1908, the vision was R. eye 0.4, L. eye 0.7, .50 cyl. axis 120° 0.9 while the left field was normal and the right contracted 5° only. This condition remained unchanged in January, 1908, *i.e.*, almost two years later. This is the second recorded case of optic neuritis following varicella, the previous one having been reported by J. Hutchinson, junr., in the *Ophthalmic Review* of September, 1886. Chavernac considers that no matter how serious the symptoms may seem, one should never despair of recovery of vision in children, and that in optic neuritis of infectious origin mercury should be used with discretion, and hetol, from its lymphagogue and alterative action, should be considered as a valuable drug. R. J. COULTER.

(2) **Sommer** relates a case of a child of five years of age brought to him on account of inflammation of the eyes. The correct diagnosis was discovered by the presence of vesicles on the face and other parts of the body. On the conjunctiva there were several vesicles and pustules, with one at the limbus corneæ accompanied by slight ulceration. Iritis followed, but with the exception of a small macula, recovery was eventually complete. The author enters a *caveat* against the view that chickenpox is without danger and requires no treatment; and also warns the ophthalmic surgeon not to omit the general survey of his patients. W. B. INGLIS POLLOCK.

XIV.—THE EYE COMPLICATIONS OF INFLUENZA.

(1) **Spriggs, N. I.—An epidemic of influenza characterised by œdema of the eyelids.** *British Medical Journal*, December 12th, 1908.

(2) **Maklakow, A.—Optic neuritis with the appearance of a white star-shaped figure in the macular region, the result of influenza. (Neuritis optica mit Entwickelung einer weissen Spritzfigur in der Makulagegend infolge der Influenza.)** *Klin. Monatsbl. f. Augenheilkunde*, Februar, 1909.

(1) **Spriggs** (London) brings together from the experiences of various practitioners a number of cases which lead him to conclude that œdema of the eyelids, generally associated with severe frontal headache, may be an early symptom of influenza. This may or may not be followed or accompanied by pyrexia and other general symptoms. The usual history (Dr. Piggott's cases) is that the patient goes to bed well but wakes with marked œdema. There is no redness, or, at most, a faint pinkish tinge. During the next twenty-four hours a bad headache develops, localized to the supra-orbital region. The œdema advances till the eyes are completely closed. There may be deep congestion, often accompanied by conjunctival œdema, but no discharge. Temperature never rises above 101° F.; but in about half the cases after a few days, as the œdema recedes, the ordinary symptoms of influenza set in. In about the other half the above symptoms constitute the whole illness. Only 7 males out of 40 cases were effected with œdema.

ERNEST THOMSON.

(2) **Maklakow** records the following case.—A boy, aged 10 years, noticed three days after the onset of influenza, an impairment of vision in the right eye. On examination, severe unilateral optic neuritis was found; V.$\frac{2}{60}$; macular region, periphery of the retina, and field normal. About two weeks later, white linear patches, arranged as in albuminuric retinitis, were seen in the macular region, while examination of the urine revealed absence of albumen, sugar, and casts. By this time the swelling of the disc had become less; =V.$\frac{3}{10}$. Ten days later the optic neuritis had subsided, but the macular changes were still unaltered V.=$\frac{4}{10}$. During the following three weeks the retinal changes disappeared. The final vision was $\frac{5}{10}$, when no trace of the passed inflammation of the optic nerve and retina was visible. Treatment consisted at first in sodium salicylate, and later on in potassium iodide.

C. MARKUS.

XV.—THE EYE COMPLICATIONS OF SCARLET FEVER, ETC.

(1) **Parsons, J. Herbert.—Ocular complications of scarlet fever and diphtheria.** *Practitioner*, Vol. LXXXII, No. 1.

(2) **Terrien, F.—Ocular paralysis in the course of scarlatina.** (**Des paralysies oculaires au cours de la scarlatine.**) *Ann. de Méd. et Chir. Infantiles*, 1er mai, 1909.

(1) Ocular complications are uncommon in scarlet fever. Acute conjunctivitis is not an integral part of the clinical picture, as in measles, and when present, it is probably due to introduction of epithelial scales into the eye from lids.

In rare cases a pseudo-membranous or membranous conjunctivitis occurs (Debièrre, Uhthoff, Stöwer), due to streptococcic infection and less often to the diphtheria bacillus. Possibly in the latter the xerosis bacillus has been mistaken for the Klebs-Loeffler organism. Streptococcic conjunctivitis, when it occurs, is a serious complication, since corneal ulceration of a peculiarly virulent nature is liable to be set up, the cornea necrosing with extraordinary rapidity, and the eye being inevitably lost. Few such cases are on record (Kendall) after scarlet fever, although **Parsons** (London) has had experience of them after whooping cough.

Abscess and gangrene of lids (Jackson and St. Martin) have been reported. von Graefe pointed out years ago that keratomalacia occurs sometimes. The most important complications, however, are secondary to nephritis. Uræmic amaurosis, without ophthalmoscopic signs, is commonest. Albuminuric retinitis is rare, and, according to Nettleship, is more often due to congenital syphilitic disease of kidneys. Retinitis of albuminuric type, without albumin, has been reported by Vance. One case of embolism of central artery of retina was reported by Hodges.

Optic neuritis is rare. There were three cases only out of a series of 253 patients with optic neuritis due to various infectious diseases, collected by Uhthoff. Groenouw collected five cases of scarlatinal optic neuritis, one with albuminuria (Barlow), and three without (Betke, Vance, Pflüger). Orbital cellulitis has been observed (Gregory, Deval). Nettleship attributed a case of unilateral optic atrophy to this cause. Such complications as periostitis (Strubell), dacryocystitis (Kendall), dacryoadenitis (Linder), and paralysis of the extrinsic ocular muscles (Lenhartz) must be regarded as rarities.

In diphtheria, membranous conjunctivitis is the commonest form of eye disease due to Klebs-Loeffler bacillus, but it is relatively infrequent in England, as was long ago pointed out by Tweedy and others. It is rare also in France, Switzerland, and Russia; on the other hand, it is not uncommon in North Germany, but is uncommon in the south and west of that country. Other organisms may cause formation of membranous or pseudo-membranous conjunctivitis, and such cases are liable to be mistaken for diphtheritic conjunctivitis, an excusable mistake owing to the frequent presence of the xerosis bacillus in the conjunctival sac—the bacillus being morphologically identical with the Klebs-Loeffler, and not distinguishable even by cultural experiments. A series of cases of membranous conjunctivitis exhaustively investigated by inoculation experiments has shown conclusively that even the apparent severity of the conjunctivitis is no guide to the probability of it being due to the Klebs-Loeffler bacillus. Hence, statistics are likely to be peculiarly untrustworthy. Neisser's method of staining is fortunately fairly trustworthy as a means of distinguishing between the Klebs-Loeffler and the xerosis bacilli, if carried out with minute attention to detail in *technique*. Staphylococci, streptococci, and other pathogenic organisms, are usually present with the diphtheria bacillus in membranous conjunctivitis; it is doubtful if the Klebs-Loeffler can attack a normally healthy conjunctiva. Uhthoff regards a previous conjunctivitis as necessary in the human subject. Axenfeld supports this view, and points out that virulent diphtheria bacilli have been found on the normal mucous membrane of throat, and by Coppez and Pichler in the normal conjunctival sac. A fact of some diagnostic importance is the presence of albumin in the urine with a raised body temperature It is astonishingly seldom that faucial diphtheria is present at same time, but extension to the throat is not uncommon (Blodig). Parson's own experience does not confirm this latter statement, possibly because his cases were treated at an early stage. Serum treatment is most efficacious, and should be adopted in every doubtful case, and used in addition to subcutaneous injection as a local instillation, which latter method is theoretically justified, and has appeared to be of practical service. Conjunctival diphtheria is rarely followed by post-diphtheritic paralysis. Apart from severe corneal complications likely to lead to loss of sight or to complete loss of eye, cicatrisation which follows detachment of membrane may cause symblepharon, entropion, trichiasis, and gangrene of lid (Schillinger). Diphtheria of the lacrymal sac, due to extension from nose (Landmann, Feilchenfeld), is commoner than from conjunctival sac (Caspar), and may lead to destruction of tear-sac. Orbital abscess is probably caused by a mixed infection with pyogenic organisms (Rheindorf). Optic neuritis is seldom caused by diphtheria, Uhthoff having found it in 6 cases only out of a series of 253 cases caused by infectious diseases. Some authors regard it as common, but they probably mistake the well-known pseudo-neuritis for the pathological condition. Donders first accurately explained the "amblyopia" due to paralysis of ciliary muscle, which, as before stated, is rare after conjunctival diphtheria, but common after that of throat. Onset is gradual and varies in time (Woodhead) from a few days to a few weeks. Both eyes affected, usually in equal degree. Patients are usually children under 14 years of age (91 % Remak). Diagnosis is dependent upon subjective tests, as it is seldom that the iris is affected. A proper routine in examination of vision of all patients is important, and in children it is imperative that the near and distant vision should be tested in all cases before instillation of a mydriatic. Paralysis of accommodation by atropine is essential in correction of refraction of nearly all children under 14 years, so that

if near vision has not been tested before, it will be impossible to diagnose post-diphtheritic paralysis or paresis of accommodation. Cycloplegia is not infrequently accompanied by paralysis of palate—Remak says in 28% of the cases—absence of knee-jerks, paralysis of extrinsic ocular muscles usually external recti (Remak. Moll 11%) Herschel, Jessop, and König observed contractions of field of vision, probably due to neurasthenia (König). In ptomaine poisoning paresis of accommodation is almost always accompanied by that of the iris. There is little or no relationship between the severity of an attack of diphtheria and that of cycloplegia, the worst cases may follow undiagnosed throat condition. Prognosis is good, recovery, usual in a few weeks, may be delayed for several months. Characteristic features of paralysis of extrinsic ocular muscles occurring after diphtheria, are rapid onset, partial nature, quick recovery. Complete paralysis very rare—only one case recorded (Parkinson). Paralysis superior oblique, occasional ophthalmoplegia externa recorded several times, first by Uhthoff, found chiefly in childen 8-10 years old, two to six weeks after onset of the primary disease, both eyes affected sometimes in unequal degree. Cycloplegia rare in these cases, which thus differ from most of the other post-diphtheritic paralyses. ANDREW FULLER.

(2) **Terrien**, of Paris, points out that of all the ocular complications of scarlet fever, disturbances of the musculature, internal or external, are amongst the rarest. As regards internal ophthalmoplegia, three cases only are known, namely, those reported by Forster, Schmidt-Rimpler, and Remak respectively. The condition, which is really less of an ophthalmoplegia than of an enfeeblement of accommodation, may last for several months, and, indeed, in Forster's case it had not disappeared $1\frac{1}{2}$ years after the infection. Paralysis of the extrinsic muscles is even less common, since Lenhartz is the only author who has published a case, and there the diagnosis of scarlatina was not altogether certain.

Terrien's own case was briefly as under :—

A child of $13\frac{1}{2}$ years was brought with diplopia, which dated from an attack of scarlet fever fourteen months before. Family history unimportant. The scarlet fever had been without complication, but on the third day after the appearance of the eruption, the left eye was noticed to be deviated up and out. Somewhat later, the eye resumed its normal position, but the left internal rectus remained paretic, and from this moment the patient complained of crossed diplopia, rendered more manifest by the use of the red glass The double vision was present more than two years after the beginning of the visual disturbance. There was no ptosis, and, indeed, none of the muscles of the eye, internal or external, were affected, with the exception of the left internal rectus.

SYDNEY STEPHENSON.

XVI.—REMEDIES.

(1) Gonzalez, José de Jesus Leon.—Electricity as a hypotonizing agent in ophthalmology. *Anales de Oftalmologia*, April, 1908.

(2) Walker, A. Nimmo.—The treatment of ophthalmia neonatorum. *Liverpool Medico-Chirurgical Journal*, July, 1908.

(3) Bérard.—On complete temporary paralysis of the levator palpebræ superioris following a deep sub-conjunctival injection of 10 per cent. saline solution with acoin. A propos de la paralysie complète, mais temporaire, du releveur de la paupière supérieure consécutive à une injection sous-conjonctivale profonde d'eau salée à 10 per cent. acoinée.) *L'Ophtalmologie Provinciale*, T. V., p. 143, septembre, 1908.

(4) Happe, H.—On non-specific serum-therapy in ocular infection. (Zur nicht spezifischen Serumtherapie bei Augeninfektionen.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1909, p. 141.

(5) **Lenz, G.** — **Upon the feasibility of anti-ferment treatment for suppurative processes in ophthalmic practice.** (Ueber die Verwendbarkeit der Antifermentbehandlung eitriger Prozesse in der Augenheilkunde.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1909, p. 134.

(6) **Rosenhauch, E.**—**Gumma of the retina cured by Mergal.** Gumma der Netzhaut, mit Mergal geheilt.) *Wochenschrift für Therapie und Hygiene des Auges*, Februar 18, 1909.

(7) **Bérard, M. V.**—**A case of infective irido-cyclitis cured by Roux serum.** (Un cas d'iridocyclite d'origine infectieuse guérie par le sérum de Roux.) *Rev. d'Hygiène et de Thér.-Oculaires*, avril, 1909.

(8) **Heilborn, F.**—**On the treatment of Ulcus corneæ serpens by pyocyanase.** (Ueber die Behandlung des Ulcus corneæ serpens mit Pyocyanase.) *Wochenschrift für Therapie und Hygiene des Auges*, April, 1, 1909.

(9) **Elze, K.**—**On the necessity of the early recognition of senile cataract, and the possibility of treatment with Resorcin.** (Ueber die Notwendigkeit, den grauen Star möglichst frühzeitig zu erkennen und die Möglichkeit der Behandlung solcher Stare mit Resorcin.) *Wochenschrift für Therapie und Hygiene des Auges*, April 1, 1909.

(1) While treating a young girl affected by internal ophthalmoplegia by means of continuous currents, **Gonzalez** (Mexico) noted a decrease of tension in the eye subjected to the current, in comparison with the other eye. By experimenting on healthy eyes, he has proved that the phenomenon of hypotension is constant. The author adopts the following *technique*: he places on the eyelids an electrode adaptable to the eye in communication with the negative pole, the positive on the back of the head, and makes the current pass, increasing it by degrees until it reaches 30 or 40 milliampères, makes the sitting last 15 minutes, and decreases the intensity little by little down to 0, so as to avoid the vertigo produced when the current crosses the brain. The tension notably decreases in comparison with the other eye. The hypotony disappears, so that in 24 hours the tension is again equal in both eyes. But if the sitting is repeated daily, one succeeds in diminishing considerably the tension and in maintaining the condition for several days. The author successfully treated a case of serous iritis and another of acute glaucoma: in the first the hypertension was very marked, and, fearing to apply atropine, he had recourse to continuous currents, obtaining hypotension in 2 days and being then able to apply atropine; in the glaucoma case, the vision was 0 and the tension + 3, and after 4 sessions of 15 minutes each day, the attack yielded without eserine. The decrease in tension is doubtless due to the fact that the electric current promotes the excretion of the ocular liquids, both by its vaso-dilatation action and by changes in the osmotic pressure. The transcendental practical fact is: diminution of ocular tension by continuous currents applied through the eye. M. URIBE Y TRONCOSO.

(2) **Nimmo Walker** (Liverpool) believes that the disastrous results of ophthalmia neonatorum are not even yet properly appreciated "perhaps because the patient is inarticulate at the time of his loss of sight, and later is decently hidden in a Blind School." Of 53 cases brought to St. Paul's Hospital, Liverpool, from May, 1907, to May, 1908, recovery ensued in 34. As to the remaining 19, in 3 one cornea and in 2 both corneæ became opaque; in 9 one cornea and in 5 both corneæ perforated. One eye, then,

in every three was destroyed or permanently damaged, and that despite the fact that special means were adopted to deal with cases of ophthalmia neonatorum at St. Paul's Hospital (*see* THE OPHTHALMOSCOPE, June, 1909, p. 384). Walker emphasizes the responsibility that must rest upon any practitioner who undertakes to treat ophthalmia neonatorum, which he considers to be one of the most serious diseases that can attack the eye. Unless a medical man be prepared to inspect the corneæ himself every day, and to obtain the assistance of a skilled nurse several times daily, it is his duty, in Walker's opinion, to send the baby to some place where treatment can be carried out properly.

The principles of treatment followed by Walker include: (1) free drainage; (2) frequent and thorough removal of pus; (3) early operation in order to anticipate complications; and (4) maintenance of the patient's general resistance. Drainage is facilitated by the use of warm, wet dressings, covered with jaconet. Iced pads are condemned. Pus is removed from the eyes every two or three hours at least, and for this purpose Walker employs a post-nasal tube attached to a Rotunda douche. The flattened end of the instrument is passed beneath the upper lid, which is thus lifted from the cornea, and about a pint of warm saline is allowed to flow through the douche, so that the conjunctival sac is thoroughly cleansed. After this mechanical cleansing, zinc chloride (0·5 per cent.) or argyrol (10 per cent. to 25 per cent.) is applied. When the cornea is affected, iodoform-boric powder, as a rule, is substituted for astringents, and physostigmine is applied to the eye. Under these circumstances great dependence is placed upon kerotomy,* the effect of which is very marked if it be done early enough. Should that fail, and the cornea appear likely to become perforated, Guthrie's or Sæmisch's section is performed. This desperate remedy may, however, save the eye from total destruction. The mother should nurse her child, and when that is impossible, humanised milk should be employed. The advisability of providing a wet nurse for babies suffering from ophthalmia is worth considering. SYDNEY STEPHENSON.

(3) **Bérard** records three cases of paralytic ptosis following subconjunctival injections of 10 per cent. solution of sodium chloride with acoin and lasting five or six days. He considers that the paralysis was due to the use of too strong a dose of acoin rather than to the strength of the saline solution, as suggested by Villard, who has also reported a case In each of the four cases considerably more than the usual amount of 1 per cent. solution of acoin was added to the saline solution injected. R. J. COULTER.

(4) **Happe** (Freiburg i. Br.) immunised animals by feeding them on yeast, by injecting Deutschmann's serum, and by injecting anti-diphtheritic serum. He then infected them with accurately measured doses of pneumococci and staphylococci, and compared the results with those obtained in non-immunised control animals. The results are clearly set forth in tabular form. No difference could be detected in the infective processes induced in both sets of animals. In the discussion which followed, Deutschmann defended his serum, and cited many clinical cases when the results of treatment had been brilliant. Schmidt-Rimpler had not had any success with Deutschmann's serum

* Kerotomy, which was devised by the author's father, the late George E. Walker, of Liverpool, is performed as follows.—A broad needle is passed through the sclera, just behind its junction with the cornea, until the shoulder of the instrument is seen in the anterior chamber. The puncture is repeated at intervals until the circumference of the cornea has been traversed. In severe cases the bridge between the incisions should equal in width the incisions themselves. The operation causes no loss of aqueous, or, if it does, the fluid is replenished so rapidly that the anterior chamber is as full after the operation as before.

Axenfeld said that Deutschmann's experimental work was inconclusive and at variance with that of Neisser. v. Hippel, senr., found the serum so active in ulcus serpens that he never had occasion to use the cautery. Mayweg gave an account of many cases sucessfully treated with diphtheria serum. v. Michel had given the serum an extensive trial, but had found it useless.

T. HARRISON BUTLER.

(5) Müller and Peiser, at the German Surgical Congress in 1908, brought forward a new method of treating certain suppurative processes. The theoretical basis of the method is explained by the following fact.—If one puts a drop of pus from an acute coccal abscess upon one of Löffler's plates and incubates it at 60° C., deep cavities appear in the film of serum. These depend upon the action of a proteolytic ferment contained in the leucocytes which is liberated when they disintegrate. No such cavities are formed in pus from a "cold" tuberculous abscess. The proteolytic action of the ferment can be inhibited by an albuminoid, thermolabile, inhibiting body (*Hemmungs-Körper*), which acts as an anti-ferment. This anti-ferment is present in blood serum and especially in ascitic fluid. By artificially adding more anti-ferment to a tissue which is being disintegrated by the proteolytic ferment, it is possible to paralyse the over-production of ferment and its deleterious action. Peiser (Breslau) has used ascitic fluid for this purpose, and has found that when used in abscesses with smooth walls it has a very beneficial effect. **Lenz** (Breslau) has tested the product in ophthalmic practice. He thinks it is useful in abscesses of the lid; they can be made to heal with a small incision, and need not be so widely laid open. He fancies that lacrymal phlegmon is favourably influenced. It was useless for blennorrhœa and for ulcus serpens. T. HARRISON BUTLER.

(6) **Rosenhauch's** patient was a man of 24 years who had syphilis three years earlier. The gumma lay in the retina between the papilla and the macula, but at a slightly lower level than both. The colour was greyish-white and a whitish streak extended to the edge of the disc, as if due to an altered bloodvessel. Measuring four disc-diameters, the surface at its highest was 2.5 D. over the retina. Vision=fingers at 4 m. and Snellen 3 at 9 cm. otherwise both eyes were unaffected. The treatment consisted of mergal internally in increasing doses and ung. cinereum applied to the temples. After three months, the vision was still the same, but the gumma had been replaced by an atrophic area. A slight pallor of the optic nerve at the end of the treatment may have been due to the nerve being affected without the eyeball, as the field of vision showed a concentric diminution.

Wicherkiewicz has also papers on mergal in eye work, *Postep Ocul.* 1908. Mergal is mercuric choleate, and is almost insoluble in water, but soluble in the presence of sodium chloride or other alkaline salts. It is best given in capsules (each 0.05 grm. with 0.1 gm. of albumen tannate). One capsule may be taken three or four times a day, and after five days, the dose increased to two capsules. W. B. INGLIS POLLOCK.

(7) **Bérard,** of Angoulême, is an advocate of the treatment of inflammatory affections of the anterior segment of the eye by means of paraspecific sera, as recommended by Darier. By these means he has successfully treated cases of *abcès moissonneurs* (hypopyon-keratitis or ulcus serpens) when enucleation seemed to be the only way out. He now reports (somewhat imperfectly) a case of infective irido-cyclitis, following an injury of the sclera by a spangle (*paillette*) of iron. The subconjunctival injection of mercury cyanide, the inunction of mercury, and the local application of ice had merely aggravated matters, and the pain was so great that the patient begged that his eye might be removed. Bérard, however, injected 20 cm.c. of the Roux serum, and

repeated the dose two days later, and on the following day gave 10 cm.c. Pain, relieved a few hours after the first injection, disappeared completely after the third injection. Improvement speedily set in. V.=1/3 was eventually recovered, with posterior synechiæ and a few uveal deposits on the anterior capsule of the lens. SYDNEY STEPHENSON.

(8) **Heilbron** relates the particulars of a case of ulcus serpens which continued to advance in spite of medical treatment. Instead of cauterising, pyocyanase, which is a dark-green fluid, was applied to the ulcerated surface by means of a pipette. Improvement commenced at once, and the application was repeated daily, all other treatment being omitted. Within five days the hypopyon had disappeared, and by another four days the ulcer was healed. There is no note as to a bacteriological examination. Pyocyanase is stated* to have a bacteriolytic action on a number of micro-organisms, including the gonococcus, meningococcus, streptococcus, and the diphtheria bacillus.

W. B. INGLIS POLLOCK.

(9) Since 1902 **Elze** has employed an ointment containing ½ per cent. of the finest powdered resorcin in a considerable number of cases of early senile cataract. Without giving accounts of individual cases, he states that when tested by Jaeger's test-types, with the glasses corresponding to the age of the patient, an improvement in vision of four numbers will be frequently observed as from Jr. 16 to Jr. 9, or from Jr. 7 to Jr. 3. In addition, the recovery is permanent. The lenticular opacities do not clear up, but the non-opaque portions, he thinks, transmit light more freely, and thus give the improved vision. The treatment is useless if the sectors have invaded the pupillary area or have penetrated deeply into the substance of the lens. Nuclear cataract and cases where the cataractous process is general do not respond. The author was led to employ resorcin by the reason that the lens is an epithelial prŏduct, and therefore subject to the same substances as effect the epidermis. W. B. INGLIS POLLOCK.

XVII.—MISCELLANEOUS.

(1) **Grimaldi, E.—Transitory bilateral amaurosis following typhoid fever.** *Giorn. di Biologia e Medicina*, Anno I, No. 33, Naples.

(2) **Thillier and Bonte.—The ocular complications of small-pox.** *La Clinique Ophtalmolgique*, 25 fevrier, 1907.

(3) **Marx, E.—A case of lipæmia retinæ.** *Ned Tijdschr. voor Geneeskunde*, 1907, No. 12.

(4) **Fernandez.—Hyphæma and hæmorrhage into the fundus provoked by pertussis.** *Anales de Oftalmologia*, July, 1907.

(5) **Langmead, Frederick.—A note on certain pupillary signs in chorea.** *Lancet*, January 18th, 1908.

(6) **Duyse, van.—Mumps, optic neuritis, simple meningitis.** *Archives d'Ophtalmologie*, mai, 1908.

* Emmerlich, ref. Merck's *Annual Reports*, 1907.

(7) **Black, Melville.—The relation of ocular and cardio-vascular disease.** *Journ. American Medical Association*, July 18th, 1908.

(9) **Onslin, S.—Hæmorrhage into both optic sheaths in diabetes and in fracture of the base of the skull.** *Arch. für Augenheilkunde*, August, 1908.

(10) **Fox, L. Webster and Batroff, C. Warren.—The relation between retinal hæmorrhages and high arterial pressure.** *Ophthalmic Record*, October, 1908.

(11) **Vergne, Jules.—Ocular lesions in Paget's disease.** *Annales d'Oculistique*, novembre, 1908.

(1) In a child of two years suffering from typhoid of typical form and regular course of three weeks duration, blindness rapidly came on, lasted eight days, and was followed by a gradual but complete recovery of vision. The pupil reactions were perfect, and ophthalmoscopic examination showed no lesion of the papilla, of the macular region, nor of the other parts of the retina. **Grimaldi** attributes this transitory amaurosis to a toxic trouble of the cerebral visual cortex of both lobes. A. ANTONELLI.

(2) **Thillier** and **Bonte's** article gives an account of the known eye complications of small-pox. ERNEST THOMSON.

(3) A patient, whose urine contained 7·6 per cent. of sugar, was examined by **Marx**, because of a paralysis of the abducens. On looking in the eye, he found the vessels of the retina of a pink colour, the light-reflex on the vessels was absent, and there was no difference to be seen between veins and arteries. Sight was 5/10. The blood contained, on microscopic examination, many globules of fat. On quantitative examination, the amount of fat contained in the blood was estimated at 7·5 per cent. The patient recovered, and the retina returned to its normal state. In most cases the high percentage of fat in the blood gives a bad prognosis; lipæmia retinalis is, therefore often considered to be a terminal symptom in diabetes. G. F. ROCHAT.

(4) Severe hæmorrhage into the retina is a rare complication of pertussis, although subcutaneous ecchymosis is by no means uncommon. **Fernandez's** patient was an infant, aged three years, who had been suffering from whooping cough for about a month. When first seen, the eye showed no sign of injury, but the anterior chamber was full of blood. By degrees the blood was absorbed, but it was then found that the retina showed many hæmorrhages, especially in the course of the veins and around the disc. In the course of months these were absorbed, or changed into extensive fibrinous deposits, which appeared as white patches on the fundus. Vision was totally lost.
HAROLD GRIMSDALE.

(5) **Langmead** (London) calls attention to changes in the iris muscles frequently seen in chorea—1. Hippus is very marked. 2. A synchronous contraction of the pupil on accommodation. 3. Ill-sustained contraction to light and on accommodation, often to an unequal degree on the two sides. 4. Varying inequalities of pupils. 5. Eccentricities of the pupils.
ERNEST THOMSON.

(6) **van Duyse**, of Ghent, describes (very imperfectly) the case of a girl of eight years, who suddenly lost her sight 2½ months after an attack of double parotiditis followed by slight headaches. The optic neuritis present when she was examined by van Duyse recalled the ophthalmoscopic features of the choked disc of cerebral lesions. At a later stage, vomiting set in, headache became worse and continuous, and paresis of the tongue and of the upper and lower extremities was observed. The termination of the case is omitted. SYDNEY STEPHENSON.

(7) **Black's** citation of cases serves to show how important are ocular changes in pointing to the existence of cardiovascular disease.

C. A. OLIVER.

(9) **Onslin's** paper deals with two cases of hæmorrhage into the optic sheaths. The first refers to a man, *æt.* 45, who was picked up unconscious in the street and died a few hours afterwards in diabetic coma. The second case concerns a man who was found dazed after a fall in an epileptic seizure and died the same day. At the *post-mortem* examination the first patient showed intraventricular and subdural hæmorrhage, together with hæmorrhages into the central spinal canal and underneath the arachnoid. Both optic sheaths were distended with blood. Examination of the epileptic patient revealed a fracture of the right temporal bone, extending to the external meatus and forward through the petrous portion to the neighbourhood of the foramen ovale. Extradural and subdural hæmorrhages covered almost the whole of the brain. Microscopical examination of the optic nerves showed blood in both optic sheaths and swelling and congestion of the nerve head.

PERCIVAL J. HAY.

(10) The paper of **Fox** and **Batroff** (Philadelphia) should be read in the original, since the substance of it is contained in an elaborate table showing the particulars of 100 consecutive cases of retinal hæmorrhage seen within the first forty-eight hours following the hæmorrhage. Their conclusions, however, may be quoted, as follows:—1. 80 per cent. of retinal hæmorrages occur in individuals suffering from a temporary or permanent high arterial blood-pressure, due to the causes enumerated. 2. This excessive intravascular pressure is apparently the most frequent exciting cause of these hæmorrhages. 3. Venesection has proven of value, not only in reducing dangerously high pressure, but in acting as a powerful stimulus to a speedy absorption of the clot.

ERNEST THOMSON.

(11) In two cases of Paget's disease (osteitis deformans) **Vergne** has found fundus lesions (choroido-retinitis and optic atrophy) of types usually due to specific disease. He quotes a similar case recorded by Frechon, and suggests that a systematic examination of the eyes of patients suffering from osteitis deformans would probably lead to the discovery of evidence in support of the theory that it is a late manifestation of hereditary syphilis.

R. J. COULTER.

BOOK NOTICES.

Die Sehstörungen bei Schussverletzungen der kortikalen Sehsphäre. (Disturbances of Vision after Bullet Wounds of the Visual Cortex.) By TATSUJI INOUYE. Leipzig: Wilhelm Engelmann. 1909. Price 6s.

In this monograph Inouye records certain observations on the wounded in the Boxer outbreak of 1900 and in the Russo-Japanese War of 1904-05. The high penetrating power of modern bullets, and their consequent power of drilling cleanly and without deflection all the tissues which lie in their course, were abundantly demonstrated in our own Boer war. As a result, the wounds inflicted by them have almost the precision of a laboratory experiment, and in the case of head wounds one may expect to obtain, if not new

discoveries on the localisation of cerebral function, at least valuable confirmation or refutation of conclusions deduced from experiments on apes and from pathological processes in man. Yet one thing is lacking to the completeness of the experiment—*post-mortem* dissection ; for it is evident that the patients upon whom elaborate observations of the visual fields, etc., can be carried out are those who have reached the base hospitals and who are likely to survive.

In order to overcome this drawback, Inouye set to work as follows : By means of a series of careful measurements, made partly with an instrument of his own designing, which he calls a "cranio-coordinometer," he constructed models of an "average" or typical Japanese head and brain. The positions of the wounds of entrance and exit were then exactly determined on the patient, and were mapped out in the corresponding situation on the model head. From these *data* it was possible to plot out the intracranial course of the bullet, and the structures probably wounded. The method was applied with the most painstaking care, and the result may be accepted as essentially accurate, the error involved being, of course, the variation of any given head from the average.

In the clinical portion of the work 30 cases are recorded—a very large number considering the limited scope of the thesis, yet not so remarkable when one reads that they were derived from over 80,000 wounded. The observations were made in Tokyo. The cases include 4 of homonymous lateral hemianopsia ; 7 of inferior hemianopsia ; 5 of quadrant hemianopsia ; 5 of peri- or para-central scotoma of various form and distribution, some of them associated with hemianopsia ; 8 of concentric narrowing of the field ; 1 of multiple ring scotoma, probably hysterical in origin. It is interesting to note that in the cases of inferior hemianopsia the macula was not usually spared ; inferior hemianopsia is especially trying to the Japanese, who read from above downwards. The records, even from the very day of battle, are given with a fulness which would do no discredit to the placid atmosphere of a teaching hospital, and throw an interesting side-light on the admirable organisation of the Japanese army medical service. Incidentally also some vivid traits of the battlefield and of the experiences of the wounded emerge. Even in cases which otherwise made a good recovery, one is struck by the frequency of persistent headache, weakening of intellect, giddiness, and sleeplessness.

A chapter is devoted to a useful review of the material from a symptomatic standpoint, in which the lesions of the fundus, the pupil, the external muscles, etc., are analysed and grouped. Finally, the bearings of the observations on our knowledge of cerebral function is considered. On the whole, Henschen's views on the distribution of the visual cortex are confirmed, but Inouye attributes to it a somewhat wider extent, and holds that, inasmuch as it may be wounded on both sides, it must spread beyond the sides of the calcarine fissure, on to the adjacent surface of the brain. He believes that, in a subordinate degree, a still larger area takes part in the visual act, and that it may be brought into action when the proper visual centres have been destroyed. The macula, he thinks, is represented towards the posterior part of the calcarine fissure.

From the foregoing account it will be sufficiently evident that the author has spared no time and trouble in making the fullest use of the valuable material at his disposal. We have no hesitation in strongly commending the work to the notice as well of the neurologist as of the ophthalmologist.

GEORGE COATS.

The Muscles of the Eye. Volume II. – Pathology and Treatment. By LUCIEN HOWE, M.A., M.D, G. P. Putnam's Sons. New York and London (24, Bedford Street. Strand). 1909. Price, 16s. net.

In a previous review we spoke in terms of high praise of Dr. Howe's first volume, and said that for many years it must form a standard text-book on the important subject of eye muscles. The present part of the work is quite equal to the first and merits the careful attention of every practising ophthalmic surgeon. Starting with a chapter of definitions and preliminary considerations, the author goes on to detail the various forms of muscular imbalance which he classifies under the headings, first, simple imbalance, involving only the intraocular muscles; in this he treats of such conditions as excessive relative accommodation, actual insufficient accommodation, and so on. In the next section he takes up muscular imbalance involving only the extraocular muscles, which, of course, necessitates the whole discussion of heterophoria. Lastly, compound imbalance or anomalies of two or more groups of muscles, intraocular and extraocular, are discussed. The breadth of view here opened out is quite remarkable. Eukinesis is the proper balance and it means the proper relation of the three functions of accommodation, convergence, and torsion. These he defines as the three primary factors of muscular balance, the three secondary being resistance to accommodation, resistance to convergence, and resistance to torsion. Dyskinesis is imbalance in which accommodation, convergence and torsion do not bear their proper relationships to each other.

The following arrangement of heterophorias is very suggestive. There is active esophoria, passive esophoria, active exophoria, passive exophoria, excessive torsion, insufficient torsion, and latent vertical deviations.

The completeness with which the author has done his work is well shown by a scheme of examination of patients. It is very thorough and very searching, and we should imagine that almost no errors can escape detection if the scheme is rigidly followed throughout. Altogether, this first portion of the work is excellent, and is very complete, containing, as it does, a chapter of suitable gymnastic exercises for the whole body, under the heading of "General Treatment."

The second part of the book is devoted to actual deviations in the extraocular muscles or in the globe. It is needless to say that under this part there is a thorough discussion of the various forms of squint. We are not sure that we altogether concur with the author in introducing a lot of new names, such, for example, as hypermetropic esotropia, but although that may somewhat inconvenience a student of strabismus who has been used for years to a certain terminology, yet it by no means lessens the value of this part of the work.

Howe begins by detailing the various methods of measuring squint, and then describes the different forms in which it occurs. After dealing with squint in which there is no paralysis, he takes up those cases which are due to lesions in the brain or in the nerves.

The chapter on the differential diagnosis between non-paralytic and paralytic deviations is carefully and well done. All forms of diplopia due to muscular paralysis are well described, and this part of the work leaves little to be desired.

The section dealing with operations on the eye muscles is very long, including, as it does, something like nine chapters, so that the student may reasonably hope to find in it full information.

We are particularly struck with some of Howe's own methods, and we have

come across cases in which his anchorage to adjacent tendons would have been of the very greatest service. The book winds up with a full bibliography. Altogether, it is a work which we can cordially recommend, for it is very thorough, both in the theory of the subject, and also on the practical side.

FREELAND FERGUS.

CORRESPONDENCE.

While *The Ophthalmoscope* will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE ARTIFICIAL SPECTRUM TOP.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

I unfortunately thought that the object of Dr. Edridge-Green's letter in the April number was to throw discredit on my explanation. As I now learn that Dr. Edridge-Green "did not deal with my explanation at all," I apologize to him for my letter of the May number.

In his letter of the June number Dr. Edridge-Green says "It is only within the last few months that I have succeeded in finding the last links of my theory of vision, and as the evidence is not yet published, I cannot refer the reader to it." I shall await with the greatest interest the publication of his theory of vision in its entirety and of his full explanation of the colours of Benham's top.

I am, Sir,

Faithfully yours,

Newcastle-on-Tyne. A. S. PERCIVAL.

RUPTURE OF THE EYEBALL IN GLAUCOMA.

To the Editor of THE OPHTHALMOSCOPE.

Sir,

In THE OPHTHALMOSCOPE for April, Vol. VII, No. 4, papers by Coppez and Villard on Spontaneous Rupture of the Eyeball in Glaucoma are reviewed. In this connection the following case may be of interest.

In August, 1908, I was summoned to see an old lady, aged 81, at about midnight, and found free hæmorrhage proceeding from the globe, which had burst across the middle of the cornea, the lens being half out of the rent. The lens was opaque and almost black. She had been seen a few years previously by another surgeon, who had diagnosed chronic glaucoma and advised operation, which was refused. The sight of that eye had been lost for two or three years, according to the relatives. For a week she had complained of pain in the eye, especially at night, sleeping very badly. On removal, the eye was found full of blood clot and quite disorganised. The cornea did not show evidence of ulceration. The other eye was healthy.

Yours, etc.

CYRIL SHEPHERD, M.R.C.S., L.R.C.P.
(Assistant Ophthalmic Surgeon, Sydney Hospital.)

BUCKLAND CHAMBERS,
LIVERPOOL STREET,
SYDNEY, N.S.W.

May 12th, 1909.

NOTES AND ECHOES.

Deaths.

A lady ophthalmic surgeon, Charlotte Louisa Ellaby, died in London on May 14th last at the age of 55 years. Miss Ellaby had spent many years in India, but she returned to England in order to devote herself entirely to ophthalmology. In 1890 she organized an eye department at the New Hospital for Women, in the Euston Road, London, and was appointed the first ophthalmic surgeon to the institution. Miss Ellaby was compelled by failing health to resign her appointment some three years ago.

The death is announced of Theodor W. Engelmann, who was born at Leipzig in 1843. He acted as assistant to Professor Donders, at Utrecht, and succeeded him as Professor of Physiology in 1889. In 1897 he followed Professor du Bois-Reymond in Berlin. Engelmann wrote on physiological subjects, as the structure of the cornea, the action of light upon the retina, and so forth.

Lesshafft, of Gorlitz, died on April 2nd, at the age of 48 years, after a brief but painful illness, borne with exemplary patience. Lesshafft assisted A. von Graefe for about a couple of years.

An interesting and cultured personality has recently passed away in Ludwig Laqueur, who was born on July 25, 1839, and who succumbed to a pulmonary affection on April 20, 1909. In 1861 and 1862 he was associated with Albrecht von Graefe, in Berlin. In the latter year he also worked with Schmitz, in Cologne. From 1863 to 1869 he assisted Dr. Richard Liebreich in Paris, and having passed the French doctorate in 1869, he commenced practice as an ophthalmic surgeon in Lyons, France. His activity, however, soon found another outlet, for the outbreak of the Franco-Prussian War in the following year caused Laqueur to enrol himself under the German colours as a military surgeon. The war finished, Laqueur was appointed extraordinary professor of ophthalmology in the newly-organized University of Strasburg. Five years later he was appointed ordinary professor, a post that he retained until about a couple of years before his death. The deceased was a voluminous writer, and several of his more important contributions dealt with glaucoma, an affection from which he had suffered himself, although, thanks to a very successful operation by Horner, his sight remained good to the end. Laqueur is credited with having been the first to introduce physostigmine as a means of treating glaucoma. He was buried at Heidelberg on April 23rd in the presence of numerous friends, pupils, and colleagues. At the grave-side many touching tributes were paid to Laqueur's memory.

Leo Loeser died unexpectedly on March 20th at 35 years of age. He was born at Meiningen. He worked with Schweigger and Silex, and finally settled in Berlin. He was attached as correspondent for many years to the *Centralblatt für praktische Augenheilkunde*, edited by Professor J. Hirschberg.

The deaths are also announced of Jewetzky (Dorpat), José Thomas (Mexico), Harry Butler (Bangor, U.S.A.), W. E. Harriman (Hampton, Iowa), and, finally, of F. J. MacNett (Traverse City, Michigan).

* * * *

Appointments. GEORGE HENRY POOLEY has been appointed ophthalmic surgeon to the Sheffield Royal Infirmary, in succession to the late Simeon Snell. W. Ilbert Hancock has received the appointment of assistant surgeon to the Royal London Ophthalmic Hospital (Moorfields). W. B. Inglis Pollock has been appointed assistant surgeon to the Glasgow Eye Infirmary. Stanley Riseley has been appointed one of the medical referees under the Workmen's Compensation Act, 1906, for County Court Circuits, Nos. 13 and 18. Malcolm L. Hepburn has been appointed assistant surgeon to the Central London Ophthalmic Hospital, Gray's Inn Road, W.C. Joseph Beck has been appointed to the Chicago Eye, Ear, Nose, and Throat Hospital.

* * * *

Honours. WILLIAM OSLER, the regius professor of medicine in the University of Oxford, has accepted the appointment of honorary consulting physician to the Oxford Eye Hospital. Upon Bruno Fleischer has been bestowed the title of extraordinary professor of ophthalmology in the University of Tubingen. Dr. Georg Abelsdorff has been appointed to a professorship of ophthalmology in the University of Berlin. The title of *Sanitatsrat* has been conferred upon Dr. Wolffberg, of Breslau, editor of the *Wochenschrift für Therapie und Hygiene des Auges.* The title of *Geheimer Hofrath* has been bestowed upon Professor Axenfeld, of Freiburg i. Br. Dr. G. Lodato, formerly of Siena, has been nominated professor of ophthalmology in Palermo.

* * * *

Scientific Meetings. THE 45th annual meeting of the American Ophthalmological Society will be held at New London on July 14th and 15th. At the 45th meeting of the Canadian Medical Association, to be held at Winnipeg on August 23rd, 24th and 25th, there will be a section devoted to ophthalmology and oto-laryngology. The 14th annual meeting of the American Academy of Ophthalmology and Oto-Laryngology will be held in New York City, on October 4th, 5th, and 6th.

* * * *

Optometry Laws. THE following States now possess optometry laws:—Arizona, California, Delaware, Florida, Idaho, Indiana, Iowa, Kansas, Maine, Michigan, Minnesota, Montana, Nebraska, New Mexico, New York, North Carolina, North Dakota, Oregon, Rhode Island, Tennessee, Utah, Vermont, Washington, and West Virginia. To these must be added the Province of Manitoba in Canada.

* * * *

Welsh Medical Dinner. AT the Annual Welsh Medical Dinner held at the Criterion Restaurant, London, on June 15th, the chair was occupied by D. C. Lloyd-Owen, surgeon to the Birmingham and Midland Eye Hospital.

* * * *

The Prevention of Ophthalmia Neonatorum.

A CONFERENCE of Medical Officers of Health of the district round Birmingham was held at Hanley on April 29th, to consider the question of the prevention of blindness following infantile ophthalmia. The Mayor of Hanley (Mr. G. F. Adcock) presided, and stated that that was the second meeting held as the outcome of a suggestion made by Dr. H. H. Folker at the annual meeting of supporters of the Workshops for the Blind, to the effect that possibly a great number of cases of blindness were preventable if dealt with at an early stage, and that at least 40 per cent. of the cases of blindness were attributable to ignorance and neglect at that stage. At the first meeting it was thought desirable that ophthalmia neonatorum should be made compulsorily notifiable, and that conference had been convened further to consider the matter with the assistance of the County Medical Officer and the Medical Officers of the district.

Mr. E. V. Greatbatch (Chairman of the Joint School Authority and of the Workshops for the Blind) said that to allow sighted infants to become blind when that blindness could be prevented was a wasteful, extravagant, costly, and cruel way of dealing with humanity. What was wanted was to get the Local Government Board to make notification of ophthalmia in infants compulsory, so that the cases might be dealt with immediately. Dr. H. H. Folker advocated compulsory notification.

Dr. G. Reid (County Medical Officer) explained the difficulties in the way of action in the matter without an alteration of the law, but suggested that a deputation might be appointed to confer with the President of the Local Government Board.

* * *

Royal Society of Medicine.

THE Library of the Royal Society of Medicine, already the largest and most comprehensive medical library in the United Kingdom, containing upwards of 90,000 volumes, continues to increase its usefulness by a constant addition of new material to its shelves. It will be remembered that, in addition to the Library of the Royal Medical and Chirurgical Society, the Obstetrical, Odontological, and Laryngological Societies brought in large and valuable collections of books on their special subjects. Every effort is made to increase the utility of the library, and to render it equally useful for purposes of circulation and for purposes of reference. With this object in view, during the past year, the whole collection has been overhauled, in order to discover any deficiences in any particular subject or groups of subjects. Lists of *desiderata* were prepared by each section of the Society, and the purchase of a large number of books was ordered. *It is interesting to note that in two departments of the Library the* **desiderata** *could have been contained* on Mr. Balfour's famous half sheet of note paper, *viz.*, neurology and ophthalmology. In addition to separate works neurology is represented by 23 current periodicals whilst ophthalmology is provided for by 14 current periodicals. The ophthalmological collection of the library, including books and journals, amounts to nearly 3,000 volumes. The total number of current periodicals now taken by the Society is 320; of these 97 have been added since the amalgamation of the Societies. The extent to which the library is used may be judged from the fact that last year 7,257 books were in circulation; and one-third of this number was dispatched to the provinces, carriage free, for the use of country fellows.

* * * *

London County Council.

HYPERCRITICAL individuals might be inclined to object to the second paragraph of the circular given below, which is issued by the London County Council to teachers who have failed to pass the eyesight test :—

* * * *

LONDON COUNTY COUNCIL.

INSTRUCTIONS TO CANDIDATES WHO HAVE FAILED TO PASS THE VISION TEST.

Your acuteness of vision being defective you are desired to have your eyes examined and to obtain the advice of a properly qualified medical man. You are especially warned against all advertising sight-testing establishments and against accepting the advice of any opticians: the certificates or recommendations of such will not be accepted by the Council.

The Medical Officer has made special arrangements by which the doctors who act as Oculists for the Council will see any Candidate whose vision has been found defective, at a reduced fee for the examination of the eyes and prescription for any glasses which may be required. A list of these Oculists may be seen in the Office.

For necessitous cases, who are too poor to pay anything for medical advice, the Ophthalmic Surgeons may be consulted in the Out-Patient Rooms of various Special and General Hospitals.

Will you please see an Oculist at once, and attend at this Office on the ..... at ..... o'clock, in order that your vision may again be tested.

JAMES KERR, M.D.,
Medical Officer (Education).

EDUCATION OFFICES,
VICTORIA EMBANKMENT, W.C.

* * * *

Bowman Lecture.

THE Bowman Lecture of the Ophthalmological Society of the United Kingdom was delivered by Mr. Edward Nettleship on Friday, June 11th. The lecturer chose as his subject "Some Diseases of the Eye, illustrating Heredity."

* * * *

The Oxford Conference, 1909.

AS most readers already know, the Oxford meeting of ophthalmic surgeons will be held this year on July 15th and 16th. Visitors will be boarded and lodged, as usual, in Keble College at the rate of 7s. 6d. per day, and will meet at dinner in the College Hall on Wednesday, July 14th. Distinguished foreign visitors will

include, among others, Professor Greeff (Berlin), Dr. Motais (Angers), Dr. Rémy (Dijon), and Dr. Wendell Reber (Philadelphia). Addresses will be given by Dr. Risien Russell (London), Dr. Darier (Paris), Professor Deutschmann (Hamburg), Professor Dufour (Lausanne), and Professor Greeff (Berlin). These will appear in due course in the pages of THE OPHTHALMOSCOPE.

* * * *

Royal College of Surgeons of England.

AMONG those who are standing for election to the Council of the Royal College of Surgeons is Mr. W. H. Jessop who is so well known in ophthalmic circles both at home and abroad. In the past there have been several members of Council and presidents who have been eminent as ophthalmologists, and we hope that this branch of science may have Mr. Jessop as one of its representatives after this election.

* * * *

Dr. Bell Taylor's Will.

DR. BELL TAYLOR, of Nottingham, has by his will left £5,000 each to the British Union for the Abolition of Vivisection, the London Anti-Vivisection Society, the British Committee of the International Federation for the Abolition of the State Regulation of Vice, the National Anti-Vaccination League, and the Royal Society for the Prevention of Cruelty to Animals; the gift to the last named society is conditional on the society within three years (or such extended period as the executors may allow) procuring the passing of an Act limiting the load which any horse or other animal may be compelled to draw to a weight bearing a certain proportion to the weight of the animal. In the event of the condition not being fulfilled, the legacy shall fall into residue for distribution among the other four Societies named in equal shares. The testator also directed that all his animals and birds should be kept in comfort as long as they shall live. The estate is of the gross value of £160,000, the net personality being over £95,000.

THE
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A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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ORIGINAL COMMUNICATION.

MINERS' NYSTAGMUS.

BY

T. HARRISON BUTLER, M.D., OXON.

HON. OPHTHALMIC SURGEON, COVENTRY AND WARWICKSHIRE HOSPITAL.

MINERS' nystagmus, although infrequently seen in London, is a very common disease in many provincial ophthalmic *clinics*, and now that it has been very advisedly scheduled under the diseases for which a miner may claim the benefits of the Act of 1907, a consideration of its chief symptoms and its causes cannot be without interest for surgeons who practise in mining districts.

Miners' nystagmus is essentially a disease of the collier, and it does not appear until he has worked for some years in the pit; precocious cases are generally severe (Pohl[1]). It is not found among miners in metal workings, who often perform work similar to that of the collier, (Nuel[2]), (Romiée[3]). It is not present among boiler makers, who work in a cramped position in semi-darkness (Delantsheere[4]), nor has any instance, so far, been found of acquired nystagmus among the employées in photographic plate factories, who work for long periods of time in a feeble monochromatic light or, when orthochromatic plates are being made, in complete darkness * (Coppez[5]), (Peeters[6]).

The disease is characterised by a nystagmus, which may be vertical horizontal, or circular. It may be vertical in one eye and circular in the other, or horizontal in one eye and circular in the second. In my own practice, vertical nystagmus has been rare, the commonest types having been the horizontal and then the circular. The rate of oscillation varies from 120 to 500 a minute (Romiée[7]).

In the early phases of the disease the characteristic movements of the globes can be elicited only by making the patient look up, keeping his head in the erect position. In a very early stage the eyes must be strained up. It may even be necessary to follow the procedure recommended by Reid[8] and to rotate the patient several times until he is a little bit giddy and then get him to look up, to induce nystagmus. As the affection increases in severity, the oscillations commence when the eyes are only slightly elevated, in fact, as Romiée[9] has suggested, the angle of regard above or below the primary horizontal position at which the characteristic movements appear, may be used as a measure of the severity of the disease. In a very advanced case the oscillations are violent and constant, the eyelids twitch and the hands tremble; there is, in fact, a condition of great nervous excitability. Peters[10] is quite incorrect when he states that nystagmus ceases when the head is thrown back. It does not do so if the eyes maintain the same position with reference to the head. If the patient looks at the same object and throws back his head, the eyes move below their primary position and nystagmus may cease. Head position, *per se*, has no influence upon the disease. The oscillations can be induced in the supine position if the subject looks towards his forehead.

Many authors, including Nuel, Court, and Dransart, have stated that hemeralopia is a symptom of the disease. Court found 127 cases in 164; Dransart 5 per cent. only. Romiée[11] states that among several thousand cases

* At the firm of *Nys*, in Coutrai, the employées work in the dark room from 7.30–12, and then from 1–7 p.m. Many have continued at this work for six years, and yet no case of nystagmus has ever been seen.

he has not found one example of hemeralopia. Romiée's views on this subject are certainly incorrect, and Court's figures are excessive. It is probable that Dransart, with an estimate of 5 per cent., is not very far wrong. A miner suffering from nystagmus when asked "Do you see well in the dark?" will answer "No, I see very badly, the lights dazzle me, and everything dances." Generally, he sees objects on the ground as well as a normal individual, but the darkness induces nystagmus. This is frequently a prominent feature of the disease, the eyes are often at rest in the ordinary daylight but violent nystagmus supervenes in the dark. It cannot, however, be doubted that in a small proportion of cases there is real hemeralopia. I have myself seen only recently two cases where night-blindness in a moderate degree was present. It is probably never a marked symptom. Generally, visual acuity is quite normal when the eyes are at rest, but when the nystagmus comes on, it may fall from 6/6 to 6/60.

Miners' nystagmus, in contradistinction to ordinary nystagmus, gives rise to the subjective sensation that all objects are in rapid movement. All the lights in the mine dance, and the collier suffers from vertigo and cannot do his work. Nuel has seen an exception to this rule in an old miner. In mild cases the sufferer can "steady his eyes" by looking down for a time.

The late Mr. Simeon Snell tried to show that acquired nystagmus is occasionally present in other trades as well as among colliers. In a paper[12] read before the Ophthalmological Society he cited 22 examples of nystagmus in men engaged in occupations other than coal mining. As these cases have been extensively quoted, and have been specially collected to support Snell's theory as to the cause of the disease, it will be well to examine them critically and to ascertain whether the nystagmoid movements observed were strictly comparable to true miner's nystagmus.

Snell's first case was in a compositor. He was well on leaving his office, but when he awoke the next day he found that "his eyes were all of a dazzling sensation," objects seemed to be moving up and down. He was liable to vertigo and fainting. His health was bad. On examination, nystagmus was found to be present, the oscillations being vertical, and of a peculiar jumping up-and-down character, with some twitching of the eyelids. The nystagmus disappeared after rest, and he returned to work in two months. The manuscript was placed at a high level, and he had to look up to read it. The same youth had suffered from compositor's cramp. This is a clinical picture altogether dissimilar from that of miners' nystagmus. The nystagmoid movements developed after the young man had been a few months at his work: miners' nystagmus only appears after some years' work in a coal mine. The movements were absent after a night's rest: miners' nystagmus is at its worst after a day's work, and appears first at this time. Again, the movements rapidly disappeared after a few weeks' rest, whereas miners' nystagmus takes a much longer time to cure. Then, the movements were spasmodic and jumping, not the rhythmical oscillations of the true disease. It seems obvious that here we are dealing with a temporary overstrain of the ocular muscles causing nystagmoid movements in a weakly neurasthenic youth, who had already suffered from cramp of the fingers.

Snell's second case (also in a compositor) had no nystagmus at all and was obviously an instance of asthenopia.

The third compositor appears to have had slight nystagmus when the eyes were fully turned up; he certainly had asthenopia and ciliary spasm, due to hyperopia.

The fourth case cited was again a compositor, who was strongly astigmatic

and anisometropic. If he turns his eyes up quickly, a jerky, unsteady movement is noticed. Here again we have no nystagmus in the true sense of the word.

The next case, a compositor, had high myopia and no nystagmus.

It is unnecessary to analyse Snell's cases further; they are all of a similar character. The one example he adduces where true miner's nystagmus was present *was in a man at work in a coal mine* in the "cage." One of the cases seems to have had true acquired nystagmus, but there appears to have been nothing in his work in a rolling mill to cause any special strain of the eye muscles.

Excluding Snell's cases, which are not examples of real acquired nystagmus, but rather of asthenopia with nystagmoid movements, it can be truly said that miners' nystagmus is confined to the colliery. It is common there and, except in a few instances, it is unknown in any other trade. Nystagmus is such a frequent and often early symptom of disseminated sclerosis and other organic nervous conditions that it would be strange if one did not occasionally detect it as the sole symptom. Only recently I saw a case of insular sclerosis in which nystagmus was present only when the eyes were directed strongly to the left, just as in the miners' type it may be seen only when the eyes are directed upwards.

Before discussing the ætiology of the disease the following facts must be added to those already mentioned:

The disease is not more prevalent in gassy mines than in those free from fire damp. It first began to be described in 1861. In 1850 safety lamps were introduced. That is to say, it appeared with the introduction of the Davy lamp when the illumination was reduced from 0.5 * to 0.28. The safety lamp has now been improved. The ordinary lamp at present used has a candle power of 0.44, and the Wolf benzine lamp 0.87 c.p.

With improved conditions, better light, better ventilation, and shorter hours, the incidence of the disease shows a tendency to diminish. According to Romiée (whose figures are accepted by Nuel), 20 per cent. of all miners are nystagmic. Under certain conditions Romiée has found 65 per cent. Snell (special enquiry) states that 4 per cent. of all miners are *incapacitated* by nystagmus.

Nystagmus is not, as Snell and Dransart would have us believe, confined to the "holers," *i.e.*, the men who lie on their sides and under-cut the coal; it is more common among these men, but is often seen in all the men who work in the pit. I have recently met with a pronounced case in a man working in the Griff Colliery, which is mainly a candle mine, who had done no holing for years.

We have now the chief facts of miner's nystagmus before us, and are in a position to discuss the causes of the disease. The following are the chief theories.—It is due to cramp of the elevators of the eyes and lids, a disease strictly comparable to scrivener's palsy. This theory has been ably championed by Snell in England, by Dransart in France, and by Nieden in Germany. It is caused by the bad light in the mine, central fixation is lost, and nystagmus comes on just as it may do when a central leucoma abolishes fixation in an infant. It is due to excessive accommodation in a bad light. This is Romiée's hypothesis. We need not allude to it again, a miner does not accommodate excessively, and, as Nuel says, "No one supports Romiée in his view." Nystagmus is caused by apparent impulses from the semicircular canals whose functions have been modified by the position assumed by the miner at

* Snell (13) states that the light from a tallow candle, 16 to the lb., may, under favourable circumstances equal that of the standard candle. It generally only gives 61 to 77 per cent. of the standard amount. Candles, 18 to the lb., give 36 to 74 per cent.

his work. This is Peters' theory. It is due to a failure of co-ordination, a central cerebral disturbance. This view, which is the only one which fully accounts for all the facts, and which accepts as causal factors both the myopathic element and the bad light factor, is supported by Reid and Nuel, among others. Again, nystagmus is said to be caused by the inhalation of fire damp, which is chiefly composed of marsh gas, and by the general vitiated condition of the air in the pit. The myopathic theory has been widely accepted and is quoted in most of the text-books almost without question as the cause of the disease. Careful consideration will, however, show that it does not explain all the facts.

The fatigue postulated by Snell, Nieden, and Dransart cannot be shown to exist. The fatigue curve of a muscle does not show a clonic but a tetanic contraction. Careful tests with the Maddox rod shows no hyperphoria in the vast majority of nystagmic miners tested (Reid[14]). There are many cases of extreme hyperphoria where severe muscle strain does actually exist, but it is manifested by asthenopia and not by nystagmus. No one has ever described nystagmus as a symptom of hyperphoria, or any other variety of heterophoria. There are many other occupations in which the worker has to use a position at least as irksome as a miner's: mineral mining, ceiling decorating, boiler mending, and many others, and yet the workers at these trades do not develop nystagmus. On the other hand, Jeaffreson states that in part of the Durham coal field no holing is done, and yet nystagmus is found, a fact amply confirmed by others. I have myself cited an example in this paper. Jeaffreson thinks that sitting in a cramped position on the haunches causes a "cerebral anæmia" which gives rise to the disease. One would think that such a position would tend rather to cerebral congestion, but as neither ischæmia or hyperæmia of the brain has ever been shown to produce any form of nystagmus, the question has no great importance. Again, the nystagmus is often of different kinds in the two eyes, and yet both must undergo the same kind of strain. Snell obviously saw the weak spot in his theory, for he made a vain attempt to show that nystagmus was not confined to coal miners. He most certainly exaggerated the discomfort of the miner's position, so much so that Romiée went to the unjustifiable length of accusing him of "faking" his photographs of miners at work. When taken to task by Nuel,[16] he modified his expression from *truqué* (faked) to *arrangé* (arranged) and stated that he did not include the photographs published by Nieden and Dransart. As a matter of fact, the miner makes himself quite comfortable at his work, and places his head in such a position that he does not strain his eyes at all. I have closely questioned miners on this subject, and they do not complain, as a rule, of any eye-strain whatever at the completion of a day's work, nor is asthenopia at all common among them.

It is certainly rather extraordinary that if the elevators be the muscles overstrained, horizontal nystagmus is so very frequent.

The myopathic theory, then, cannot account for all the facts. Therefore, miner's nystagmus is not due entirely to muscle strain; there must be other constant factors.

The theory that the poor illumination of the mine accounts for the disease is more probable than the myopathic; but, as I have pointed out above, it cannot be the sole cause for the reason that photographic plate makers never develop it.

In feeble light we do not see with the cones, but with the rods. The fovea has no rods, and the retina immediately round it only a few. That which we can call the visual acuity of the rods is at its maximum in a retinal band surrounding the fovea at a distance of from 15° to 20° from it. In this

annular ring the visual acuity is practically everywhere of the same value. In a good light we fix with the fovea, but in the poor light of the mine the miner can fix at any place on this perifoveal ring, he has no retinal directing point, the necessity for accurate central fixation is absent. In consequence, there may be failure of co-ordination (Nuel[16]).

Again, the crystalline surface of the freshly fractured coal, with its myriad reflecting facets, causes a struggle between the two visual fields, for each eye perceives a different facet. So binocular vision is impaired, and a tendency towards failure of co-ordination is encouraged. This factor, a black crystalline surface, is the only one which is always present in the coal mine, but absent from other situations where men work in poor light, as, for example, in a zinc mine, in a boiler, or in a photographic dark room.

The light factor is urged by Nuel, by Romiée, by Reid, and many others as most important. Snell tried, as far as he could, to minimise its value.

There is no doubt that nystagmus is far more common in safety lamp mines than in candle mines. Snell admits this fact, and the belief is universal among miners. I, personally, get a fair number of cases annually from the lamp mines of the Warwickshire coal-field, but so far I have had only one case from the Griff Colliery, which is mainly a candle mine. Nuel[17] states that the frequency of nystagmus varies in *inverse ratio* to the illumination of the mines.

Romiée states that the frequence of nystagmus in Belgium, where the Mueseler lamp of 0.44 c.p. is used, is much greater than in Germany, where they use the 0.69 c.p. Westphalian lamp; and, again[19], he states that where the powerful Wolf benzine lamp has been introduced into a mine, the case incidence of nystagmus has fallen by 50 per cent.

Nystagmus began to be described at the time when the safety lamp was first introduced, and did not become frequent until its use was enforced by law. And yet the surgeons of the past generation were at least as good observers as we are, and we cannot suppose that they would have overlooked such a very obvious symptom as miners' nystagmus. We can safely assume that the disease appeared simultaneously with the safety lamp with its gloomy light of 0·28 c.p. As the lamp improved, the incidence of nystagmus diminished. It is not nearly so common now as it was some years ago. Miners' nystagmus is incited by darkness. Often a miner can easily read all the test types if they be placed on the floor, but as soon as the room is darkened and the types illuminated by a lamp, the eyes begin to oscillate and the acuity falls from 6/6 to 6/60. How can this be explained on the fatigue theory?

It cannot be doubted in the face of these facts that the darkness of the mine is a powerful adjunct in the production of nystagmus. As we have seen, it is not the sole cause, for the disease does not appear in other dark trades. Reid, in his valuable article in *Brain*, already alluded to, has ably refuted Snell's doctrines, and has advocated the idea that miners' nystagmus is due to a disordered co-ordination, a disturbance of the brain centres which control the equilibrium of the eye. He believes that the nystagmus depends less upon an inherent muscular weakness than upon a defective central co-ordination.

The necessity of fixation being absent owing to the small part taken by the superior macular image during dark adaptation, the eyes easily escape from control, and the habit unconsciously acquired of following the swinging pick with the eyes tends to persist.

Nuel[20] points out that in some cases nystagmus only comes on when the miner bends or lies down, even if he direct his gaze towards his feet. The oscillation has become associated with the position in which the miner works. After prolonged fixation, nystagmus appears at a smaller angle of

elevation than before. These facts, Nuel thinks, support the theory which sees in nystagmus a derangement of the central centres. The influence of prolonged fixation also explains the circumstance pointed out by Romiée, namely, that some nystagmic miners are unable to read even although the gaze is directed downwards.

This theory that the combination of the peculiar nature of the miner's work with the darkness in which it is performed induces central disturbances of co-ordination, which result in nystagmus, is a very reasonable one, and accounts for all the facts; but we know so little of the processes which go on in the brain that in talking of "disordered co-ordination" we but give a name to a symptom-complex, and transfer the explanation from the realm of concrete science to that of metaphysics. The semi-circular canals may or may not participate in the disorder of co-ordination. Peters suggests that they play the chief part, but he himself admits that he has no practical experience of the disease, and he founds his hypothesis on a false premise. He had read that throwing the head back inhibited the eye movements; this is, as we have seen, not the case. There are many trades, such as ceiling painting, in which the work is performed with the head thrown back, but they do not produce nystagmus.

Nystagmus is not the result of inhaling light hydrocarbons. It is found in mines which are free from gas. The coal mine is well ventilated and the air is perfectly fresh. Miners, as a rule, are healthy men.

We are, finally, logically compelled to admit that miners' nystagmus, like that which appears in disseminated sclerosis, is a cerebral symptom; it is the result of the miner's work, which in some way which we cannot understand disturbs the ocular equilibrium in such a manner that rhythmic oscillations appear.

The treatment of miners' nystagmus is very simple. Work in the pit must be entirely and permanently abandoned. Cure may result in a few months, but some cases last for years, and others are incurable.

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CLINICAL MEMORANDA.

ON CASES OF DIFFICULT IRIDECTOMY.*

BY

PROFESSOR M. DUFOUR,

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I SHOULD like to draw attention to a method of operating for iridectomy which was introduced into ophthalmology about twenty-five years ago by Professor Gayet, but which has remained little known to German and English authors. It is a method which allows one to make a correct iridectomy in cases where there, practically speaking, is no anterior chamber. Gayet proceeded in this way: he took firm hold of the eye by seizing the ocular conjunctiva simultaneously at two points, at the two extemities of the horizontal diameter of the cornea, by means of the Monoyer forceps. Gayet opened the eye, from the exterior to the interior, with a scarificator in such a way as to make an incision at a tangent to the upper edge of the cornea. With a sawing movement of the instrument he passed the blade into the anterior chamber. Having got so far, Gayet widened the wound by two cuts with a pair of scissors, one to the right side, the other to the left side, just as Jaques Daviel did in the primitive operation of cataract. Having finished the incision, he concluded the operation in the ordinary way by excision of the iris.

After having performed several operations with the Gayet method, I soon came to the conclusion that it was easier, and also less dangerous, to widen the preliminary incision with a pointless knife as used in the operation of herniotomy. At first I enlarged the cut with a straight knife with a round point, but afterwards used two tiny bent knives for the purpose. If the eye be hard, the operator will easily feel the moment he has cut into the anterior chamber by the sudden decrease of the resistence. Should the eye not be hard, it is more difficult to determine the exact moment; which will chiefly show itself by a trace of aqueous humour in the wound. Should the scarificator go too deep, and not stop exactly when the coat of the eyeball is sawn through, the surgeon is apt to cut the iris at its insertion. The consequences are small, since the accident does not prevent a good excision of the iris.

This operation, as descibed, is more lengthened than difficult: it is three times longer than an ordinary iridectomy. On the other hand, the results are extremely satisfactory in cases where there is increased pressure caused by anterior adhesions, or where a perforated ulcer has caused the iris to lie against the cornea. This method of operation is also very useful in cases of *seclusio pupillæ*, where the liquid of the posterior chamber has accumulated behind the iris, and having pushed the latter forward, gives it the shape of a padded ring, the so-called *iris bombé*, an aspect well-known to everybody, when the pupil appears to tie at the bottom of a funnel.

These cases are rather common, more common, indeed, even than those for which the Gayet method was invented. But as in these cases the sight is slowly but surely lost, an iridectomy is absolutely necessary. It is in these cases that the Gayet method, when properly performed, is most effectual. In

* Read at the Oxford Ophthalmological Congress on July 15th, 1909.

the above-stated cases it is not impossible to perform an iridectomy by transfixion, but it is almost impossible to perform it correctly. Either the incision is too slanting and remains in the cornea, or else it is too deep and goes through the iris. Gayet's method, on the contrary, allows one to make a correct iridectomy—that is to say, a marginal one, with a large excision of the iris, thereby preventing any of the iris being caught in the wound. Finally, in certain cases of glaucoma, where the anterior chamber still exists, but is so shallow that considering the opalescence of the cornea, one is not absolutely certain of being able to insert Graefe's knife exactly into Fontana's space, it is infinitely more prudent to use Gayet's method, easier also because the existence of the anterior chamber, enables one, by a small jet of aqueous humor, to know the exact moment when the coats of the eyeball have been penetrated.

If we consider all these different diseases which call for the use of Gayet's method, it may be fairly frequently used. In our hospital service at Lausanne we have employed it on an average ten times a year—that is to say, one in twenty of the total number of iridectomies. Those who wish to try Gayet's method should be specially warned of one thing—once you have begun the sawing movement with the scarificator, you must go on until you have sawn through the coats of the eyeball; for if you remove the instrument from the cut before having sawn through, you probably will not be able to get it back again exactly in the same spot. Finally, before introducing the small bent knives into the cut, it is wiser to assure yourself with the curette that the incision has really penetrated into the anterior chamber.*

IRITIS COMPLICATING MORAX-AXENFELD CONJUNCTIVITIS.

BY

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(From the Pathological Laboratory of the Montreal General Hospital.)

ACCORDING to the observations of Bardelli, Axenfeld, and Rymovitch,† an iritis from absorption of toxins can be associated with a pneumococcal conjunctivitis and that without any affection of the cornea. The following case leads me to believe we may have Morax-Axenfeld conjunctivitis complicated in a similar way.

Z.H——, male, aged sixty years, came under observation some weeks ago. He had been under treatment for some time for an iritis of his left eye, and had received both anti-rheumatic and anti-syphilitic medication. The eye had not made satisfactory progress, however, and the patient complained bitterly of the pain which radiated over his forehead and which greatly disturbed his rest. There was marked photophobia and lacrymation. The lids were swollen, and there was an active conjunctivitis with muco-purulent discharge. The pupil, under atropine, was moderately dilated, the iris was congested and altered in colour. Pericorneal injection was very marked. A slide prepared from the conjunctival discharge

* During the Congress Professor Dufour demonstrated his modification of Gayet's operation upon a patient.—EDITOR.

† Quoted from Axenfeld's "*Die Bakteriologie in der Augenheilkunde.*"

showed a mass of Gram-negative diplobacilli. The growth upon blood-serum was typical of the Morax-Axenfeld diplobacillus. Cultivation upon plain agar proved negative. There was no history of syphilis, a very indefinite one of rheumatism or other likely cause of the iritis, except recurring inflammations when the lids would be adherent in the morning. I believed that the iritis was secondary to the conjunctivitis, so medication by mouth was stopped, and the conjunctivitis treated energetically. The conjunctival sac was irrigated three times for ten minutes with some quarter per cent. solution of the sulphate of zinc, he was given a similar solution to instil four or five drops every two hours, and told to continue with the atropine in one per cent. solution, three times daily. When he returned two days later the improvement was marked, and his facial expression was very different. The pain was much less, the conjunctivitis was greatly improved, the pericorneal injection and the appearance of the iris showed marked diminution in the inflammation. At the end of a week the eye had made such progress that the iris seemed normal and the instillation of atropine was stopped. Knowing how persistent some of the diplobacillary infections are, it was thought best to continue the application of zinc to the conjunctiva for one week more, when the patient was discharged cured.

ON THE TREATMENT OF EYE DISEASE BY SERUM.*

BY

PROFESSOR R. DEUTSCHMANN,

OF HAMBURG, GERMANY.

THE consumption of yeast has for long been recommended in the treatment of several conditions, the chief of which are, perhaps, the purulent infections, such as furunculosis. This fact led me to try the effect of yeast in purulent diseases of the eye, but it was speedily obvious that to be really efficacious the doses of yeast must be so large as to be badly borne by the patient. It, therefore, occurred to me to interpose the body of an animal. I selected for the purpose the rabbit, which was fed with large and ascending doses of yeast. Serum was prepared from the blood of the animal, withdrawn during the period of digestion. This yeast-serum I have found to be efficacious in the treatment of eye diseases.

It would lead me too far to consider in this place the theoretical considerations surrounding the explanation of the salutary results to be obtained from yeast-serum. I may merely say that the experiments conducted by Neisser and Guerrini in Ehrlich's laboratory go to show that the product is probably to be included among the leuco-stimulants, and therein probably lies the explanation of the polyvalency of my serum.

On the present occasion I shall merely give some clinical *data* respecting the employment of my serum, and shall ask my hearers to ascertain for themselves whether or not it is useful in certain diseases of the eye. These diseases are principally suppurative processes affecting the eyeball and its adnexæ, as the orbit, the lacrymal gland and sac, and the glands of the eyelids.

Like von Hippel and Zimmermann, I have obtained the best results from my serum in cases of ulcus serpens (hypopyon-keratitis). As a rule, by its employment I am enabled to avoid the use of the galvano-cautery, and I am personally convinced that in a preponderating number of cases treated by the

* A communication presented to the Oxford Ophthalmological Congress on July 15th, 1909.

serum the diseased process can be favourably influenced and cure can be obtained with slight scarring only. At the same time I have never affirmed, nor even imagined, that every case of ulcus serpens could be cured by my yeast-serum. The serum, like every other known method of treatment, may fail, although I can say that at the present moment I know no more potent remedy for these infective ulcerations of the cornea. My own opinion coincides with that of many other colleagues, who have found cases of severe *ulcus serpens* yield to my serum when all other therapeutic measures had failed. This fact cannot be gainsaid, even although a few observers are still inclined to deny the good effects produced by yeast-serum when employed in the treatment of *ulcus serpens*. Were it otherwise, one would be compelled to deny the efficiency of the galvano-cautery or of the Saemisch section, because, in my experience, both may fail upon occasion.

It is important to employ the yeast-serum with promptitude. We must not tarry until all possibility of help has passed. As Zimmermann has well put it, "It is clearly better to inject the serum a day too early than an hour too late."

The yeast-serum exerts a favourable influence upon cases of iritis, whether spontaneous, post-operative, or connected with infective conditions of the organism. It frequently yields good results in cases of serous iritis.

Some instances of inflammatory exophthalmos have been cured by the serum, and that without surgical or other treatment.

As to infective processes of the vitreous body, it must be admitted that such are very difficult to influence by any kind of serum. Large doses of my serum, however, together with repeated paracentesis of the anterior chamber for the purpose of furthering the penetration of the anti-bodies into the vitreous, may sometimes give a favourable result.

When infection is apprehended, as in operations or perforated wounds of the eyeball, the prophylactic use of the yeast-serum is to be recommended.

All observers, including among the number even those who deny the curative effect, must admit that my yeast-serum, even when used in very large doses, has never caused the slightest harm to the patients. Since by Dr. Enoch's method, the active principles of the serum are precipitated and then dissolved in water, it follows that no so-called "serum sickness" can be produced by its injection. To this product the name of "Serum E" has been given. The latter is dispensed in little bottles, each of which contains 4c.c., that is to say, the ordinary dose for an adult. To children 2 c.c. may be administered. These doses are injected daily or, if necessary, twice a day, according to the severity of the eye disease. The injections are best made intra-muscularly in the anterior wall of the chest. The injections are reduced only if distinct improvement is observed, but they are continued for a longer or shorter time until healing is assured.

The fact should also be mentioned that my yeast-serum has been found to be of service in the treatment of human infective diseases generally, and, further, that it has shown itself to be an excellent adjuvant in the treatment of pneumonia, scarlet fever, measles, and general septic and pyæmic invasions. But here, just as in eye diseases, it must be injected early enough and in adequate doses. No benefit can be expected from the remedy when it is given to an exhausted patient almost in the throes of death!

I conclude by unreservedly recommending my hearers to employ my serum in suitable cases, all the more so since its harmlessness is confirmed by all investigators.*

*The following references to yeast-serum may be found in recent numbers of THE OPHTHALMOSCOPE: Volume VI, p. 513, p. 940, p. 1,000; Volume V, p. 755.

THE PREVENTION AND CURE OF AMBLYOPIA IN STRABISMUS.

BY

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SINCE the introduction of the amblyoscope by Worth into the treatment of squint, a good deal more attention has been given to combating the tendency which these cases have to develop into a form of amblyopia. The amblyoscope developes the fusion faculty, and if employed early enough and the exercises kept up for a considerable period, the normal development of the visual functions of the brain will follow. However, in certain cases, especially those which come under notice rather late in infancy, the development of the visual act is only partially accomplished even with the most persevering use of the amblyoscope, for the reason that it develops only a portion of the visual organs of the brain. The full development of the visual sense entails the employment, not only of the higher and lower visual centres, but their correct co-relation with the other brain centres, necessarily associated with the act of seeing, such as memory, recognition, etc., and it is the connecting links between these centres which are so difficult to build up or to restore in cases of amblyopia following squint. The amblyoscope was originally brought out for developing the fusion sense, but this sense is but a small portion of what requires developing ; moreover, the pictures employed in it only tend to restore the ability to recognise pictures, or as I have termed it landscape vision.

The stimulation of the fusion sense through this picture or landscape perceptive centre—in reality only a portion of what constitutes the lower visual centre—is often of itself sufficient to arouse the whole visual organism of the brain. On the other hand, it often fails, and a condition ensues which constitutes a greater or less degree of amblyopia. When such cases are encountered it is obvious we ought to be able to resort to other means for arousing the dormant visual centres. For this purpose I have for some time been in the habit of using a set of transparent sheets of celluloid on which are printed letters of a certain size, and based upon the same principle as my "Home Trainer." The use of these sheets, in the conduct of a case, follows immediately after the ability to recognise pictures under equal illumination has been reached. The sheets are in duplicate, and one is inserted in each end of the amblyoscope, but that opposite the visually better eye is covered or the light opposite it is turned down or out. The patient is then asked to read out aloud the letters, and when a mistake is made a momentary view is given to the other eye by removing the screen or turning on the light. The cards are made by Messrs. Davidson & Co., of Great Portland Street, London.

NOTES ON A CASE OF PTOSIS TREATED BY A MODIFICATION OF MULES'S OPERATION.*

BY

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IN cases of congenital ptosis in which the superior rectus cannot be utilised to replace the action of the levator palpebræ superioris, Mules's operation has many advantages. The retention, however, of a loop of silver wire in the tissues is open to objection, and N. Bishop Harman† has suggested substituting for it a loop of gold chain. In the present case, following the example of my friend, F. P. S. Cresswell, I decided to substitute silk for the silver

FIG. 1.

wire, in the expectation that, even after the absorption of the suture, a cicatricial band would be left in the tissues of the eyelid which would be sufficiently strong to produce the desired amount of elevation.

Annie M., aged 15 years, was sent to me at the Newport and Monmouthshire Hospital by Dr. D. T. Richards, of Risca, on March 6th, 1907, complaining of inability to raise her eyelids properly, which was stated to have existed from birth. On examination, she was found to have a typical congenital ptosis (fig 1), associated with absence of upward movement of the eyeballs. The other ocular movements were normal.

On March 26th, under chloroform, a silk suture was introduced into the right upper eyelid following closely the directions given for the insertion of the silver-wire suture in Mules's operation except that ordinary straight needles

*Case shown at the clinical meeting of the South Wales and Monmouthshire Division of the British Medical Association on February 4th, 1909.

†THE OPHTHALMOSCOPE, Vol. I, p. 137.

were used instead of the special ptosis needles. The points of exit of the needles were then joined by an incision through the skin and the suture having been tightened so as to produce an amount of elevation of the eyelid which was judged to be sufficient, was tied, and the skin incision was brought together by a silkworm gut suture. Healing took place without any complications, and on May 24th, 1907, the patient returned very pleased with the result and anxious to have the other eye done, but was advised to wait some time, in order to see whether the improvement would remain permanent. On February 25th, 1908, the condition of the right eye being still satisfactory, a similar operation was performed on the left, but the suture was tied a little tighter, as it was considered that a slightly greater effect might be produced with advantage. The healing was again uneventful, and October 8th, 1908, the patient came again with both eyelids well raised (fig. 2), but the left

FIG. 2.

considerably better than the right. As the girl, who was at first very pleased with the right eye, now wished to have it made as good as the left, additional sutures were inserted midway between the original one and the outer and inner ends of the lid, on October 17th, 1908. Unfortunately, these were not properly buried, and had to be removed after an interval of three weeks; but in spite of this, they have produced cicatricial bands sufficiently strong to produce the desired effect. At the present time the patient can keep both her eyes well open and can also shut them tightly, while her corneæ are covered when she is asleep.

TRANSLATION.

TWO CASES OF AMAUROSIS ASSOCIATED WITH NASAL HYDRORRHŒA.*

BY

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THE continued escape of cerebral-spinal fluid from the nasal fossæ is a rare symptom. In 1882 Leber published such a case, and he could at that time find five cases only reported in literature, all by English writers. Since then, several observations have been published, but nasal hydrorrhœa still remains an exceptional phenomenon. During the last few months, however, I have met with two cases of the kind. The main points in the history of these cases may be briefly described as follows:

The first case was observed in a young man, 26 years of age. The hereditary antecedents were of no importance. The parents were living and in good health. An older sister and younger brother had never been ill.

The patient himself had suffered from typhoid fever at the age of ten years. In March, 1903, after an attack of influenza, there developed a slight buzzing in the right ear. Otitis media was diagnosed by one specialist, but two others succeeded in finding nothing. Treatment did not relieve the symptom. At the beginning of July, 1903, the patient complained of passing obscurations of sight. Upon examination, I found that the sight of each eye was normal; that ID. of hypermetropia was present; and that bilateral papillary stasis was present. In September, after a stay in the country, the buzzing in the ear had changed to a blowing (*souffle*), perfectly audible on auscultation of the cranium. The sound, isochronous with the cardiac systole, was arrested on digital compression of the carotid artery. An aneurism of the internal carotid artery was believed to be present, and on that account the common carotid was ligated. The immediate result was satisfactory. The objective *souffle* disappeared with application of the ligature; the subjective *souffle* persisted for several days, but, finally, disappeared completely. Sight, already lost before the operation, did not improve. It is important to note the rapidity with which vision had failed in this patient.

Scarcely had he recovered from the operation, when the patient was seized with violent pains in the head, accompanied by raised temperature. He became much weaker. Tuberculous meningitis was suspected, but examination of the sputum and of the cerebro-spinal fluid yielded negative results. The first lumbar puncture brought about a considerable relief, but those that followed remained fruitless.

During the years 1905 and 1906 the patient was examined by many medical men, notably by some of the most eminent Parisian neurologists, but scarcely one agreed as to the diagnosis of the condition.

In March, 1907, I brought the patient under the notice of the members of the Brussels Polyclinic. The symptoms were then those of cerebral compression, but without any sign of definite localisation. Subjectively, there was a *souffle* in the right occipital region, accompanied by painful shocks (*chocs douloureux*). There was anosmia,

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vertigo without ataxy, and sometimes epileptiform crises. The knee- and Achilles-jerks were exaggerated; the plantar reflexes were abolished. Intelligence remained intact. There was, however, a little hebetude. The patient sometimes remained seated for the entire day, and his apathy was apt to pass into violent fits of passion. He had become considerably stouter. The flesh of the face was sallow and bloated, and a certain degree of exophthalmos was present.

The situation remained without material change until July, 1908, when suddenly, after a particularly violent migraine, nasal hydrorrhœa came on. All the phenomena of cerebral compression at once receded. The headache, vertigo, and convulsive crises disappeared; the patient could walk with ease; the reflexes became normal; and the patient lost five kilogrammes in the course of a few days. His condition at that time was much as it is to-day. That which struck those who had known the patient formerly was the modification in his physiognomy, which had become quite natural.

Nasal hydrorrhœa has existed for five months. Every minute five drops escaped from the nostrils. In other words, during the twenty-four hours 300 to 400 grammes ran away. The liquid possessed the limpidity of crystal. There were some traces of mucin; but the microscope revealed no cellular elements. According to Dr. Hennebert, who undertook a nasal examination of the patient, the fluid escaped drop by drop from the orifice of the sphenoidal sinus.

What diagnosis should be made in a case such as the foregoing?

The diagnosis of aneurism of the internal carotid can no longer be maintained. The cardinal symptoms of that affection have never been present: neither unilateral exophthalmos, nor pulsation, nor paralysis of the oculo-motor nerves. Neuro-paralytic keratitis, retinal hæmorrhages, and congestion and œdema of the conjunctiva were one and all missing.

Intracranial aneurism of the carotid artery is almost invariably accompanied by rupture of the artery into the cavernous sinus. The blood from the ophthalmic vein under those circumstances cannot escape freely, with the consequence that all the orbital region becomes the seat of passive congestion. Aneurism without rupture is quite exceptional: its symptoms are otherwise the same as those of arterio-venous aneurism, but they are less pronounced. The pulsation is intermittent, and the reflux of blood is less.

For these various reasons I am myself convinced that my patient was not affected with carotid aneurism. But before proceeding farther we must not forget that other cerebral arteries may become aneurismal.

According to Oppenheimer, aneurismal dilatations affect by preference the basal arteries before their entrance into the cerebral substance. Such aneurisms may reveal themselves only by death, which comes about suddenly by rupture of the sac. Headache, pulsations, vertigo, and vomiting may be present in such cases, *but there is no papillary stasis.* The Sylvian and the basilar arteries are those principally affected. Aneurism of the former vessel produces by compression motor phenomena, monoplegia, aphasia. In my case there was nothing of the sort. Aneurism of the latter vessel is accompanied by hemiplegia.

Then, one might think of a tumour, which sometimes determines a *souffle*, perhaps by compression of a large vessel or perhaps by its own structure, supposing the same to be of a vascular nature. Angiomata of the cerebrum are not rare; they are sometimes cavernous and encapsulated, and sometimes diffuse. True telangiectasies of the meninges may occur.

I am far from rejecting the hypothesis of a tumour, although certain facts seem to tell against it. First, there is the long duration of the affection,

which has lasted for five and a half years without having altered notably the general state; and, secondly, there is the total absence of any localising symptoms.

Nasal hydrorrhœa is sometimes seen in cases of cerebral tumour, but the perforation of the cranium is not due to the neoplasm itself. In most of the published cases the neoplasm lay far from the nasal fossæ, by preference in the posterior parts of the brain. Moreover (a curious thing), in no autopsy has the fissure which gave exit to the fluid been identified with certainty. It is therefore plain that anosmia and hydrorrhœa do not constitute so-called localising symptoms.

The rapid loss of weight which followed escape of the cerebro-spinal fluid was probably due to decompression of the hypophysis.

Hydrocephalus is the condition that is most often accompanied by nasal hydrorrhæa, continuous or intermittent. But hydrocephalus, after all, is merely a symptom that may depend upon very different causes. I put on one side in this connection congenital hydrocephalus, where the cranium assumes a form and dimensions that are quite characteristic. Apart from this, hydrocephalus may be secondary to a tumour of the posterior cerebral fossa, compressing the vein of Galen and thus obstructing the exit of venous blood. Besides, compression of the aqueduct of Sylvius may interfere with the communications between the ventricles themselves and of the ventricles with the sub-arachnoid space. Purulent, and especially tuberculous, meningitis, is often complicated with hydrocephalus. In addition to these secondary forms, there is essential hydrocephalus, of which the principal type is represented by the ventricular serous meningitis of Quincke. As causes of this affection have been cited traumatism, cerebral overwork (*surmenage cérébral*), alcoholism, and acute infections, especially those of pneumonia and typhoid fever. Some writers believe that tuberculosis plays an important part, while others have frequently seen this form of meningitis become complicated with inflammation of the middle ear.

The symptoms of hydrocephalus possess nothing characteristic. They are all connected with intracranial hypertension. Oppenheimer remarks that they are almost the same as those that accompany a tumour of the cerebellum. In hydrocephalus, however, there are remissions, which may be prolonged for years, and such are quite exceptional in cases of tumour. A. Fuchs has pointed out that in acquired hydrocephalus there are often buzzings in the ears and sometimes *bruits de souffle* audible on auscultation of the head. Under such circumstances, the erroneous diagnosis of aneurism of the cerebral arteries has even been made, a consideration that applies perfectly to my present case.

There is nothing accordingly to negative the view that the symptoms in my patient, including among them the nasal hydrorrhœa, are due to internal hydrocephalus. But it is difficult to go further. Have we to deal with hydrocephalus secondary to a cerebellar tumour, or with a serous meningitis due to the typhoid fever with which the patient was affected at the age of ten years, or to the more recent attack of influenza? Ought one to suspect otitis media, of which the existence is not otherwise clearly demonstrated? Those points must be left for the future to decide.

The second patient has not undergone such vicissitudes as the first, although the one case is as obscure as the other.

The patient is a woman, aged 35 years. Her antecedents, family and personal, are uninteresting. Menstruation commenced at the age of 14 years, and the patient has always suffered from violent migraine at the periods. Married at the age of 26½ years, she is the mother of two children, aged

respectively seven and four years. The latter is rather delicate. Some little time after the last child was born the mother gained flesh considerably. She then weighed 92 kilogrammes.

Two years ago the patient was seized with headache, localised to the forehead and the nape, especially at night. At the same time vertigo, nausea, and emesis made their appearance, and the sight suffered. The woman, besides, became conscious of a musical noise. At this time my father, Professor Coppez, discovered bilateral papillary stasis, and instituted an intensive mercurial treatment. The visual field showed nothing characteristic. The mercurial treatment produced no improvement, and after a stay of some weeks in the *clinique*, the patient returned to her home in the country.

Symptoms of cerebral compression persisted during the following months The left optic nerve underwent complete atrophy, and the right eye began to suffer in its turn, when nasal hydrorrhœa made its appearance suddenly in July, 1908. The clinical picture then resembled that of the first patient, with this difference, namely, that sight returned in the right eye, where atrophic changes were still incomplete. Headaches, vertigo, and nausea disappeared. Loss of weight was as marked in this as in the first patient. Briefly, this patient has recovered her feelings of *bien-être*, which she had lost for two years. The nasal secretion presents tbe same characters as that of the first patient. The amount is the same, and microscopical examination reveals no peculiarity. In this case, as in the first, we must await developments before the diagnosis can be made with certainty. SYDNEY STEPHENSON.

REVIEW.

THE DIAGNOSTIC SIGNIFICANCE OF THE PUPIL AND ITS REFLEXES.

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(*Concluded.*)

Abnormalities of the Pupillary Reaction. Disturbances of the Light reflex.

1. **Amaurotic rigidity of the Pupil** (Bach). **Reflex deafness** (Heddäus).—If the lesion is one-sided, *illumination of the eye of the affected side causes no contraction of either pupil, while illumination on the other side causes contraction of both pupils.* For example, with a right-sided lesion the right pupil reacts to light consensually but not directly. If the lesion is bilateral, neither pupil reacts to light directly or consensually.

The other pupillary reflexes are not disturbed. Mydriatics and miotics affect the pupil in the usual manner. The symptom indicates a *complete interruption of the centripetal side of the reflex arc in front of the chiasma*; that is, a lesion of the retina or optic nerve. Since the visual and pupillary reflex mechanisms are closely associated in this part of their course, blindness will, as a rule, be present on the side of the lesion, hence the name, amaurotic rigidity, proposed by Bach, which directs attention to the fact that the lesion is in the centripetal part of the reflex path. With degrees of visual defect short of absolute blindness there will be diminution of the pupillary activity instead of loss. In the great majority of cases the visual defect and the

disturbance of the pupil reflex go hand in hand, but cases occur in which there is a marked discrepancy between the two, the light reflex being preserved in spite of the presence of "peripheral" blindness, or the reflex lost and vision preserved. An example of the former kind is the case reported by Jessop [33], which presented blindness, due to optic atrophy, but had not lost the pupillary light reflexes. Similar cases have been seen by Westphal, Piltz, Bach, and others. An interesting contribution of Reichardt's [34] seems to throw some light on this apparent contradiction. He observed a case in which, along with left-sided blindness and optic atrophy, the light reaction was still intact. Microscopic examination of the optic nerve showed that most of the fine fibres were degenerated, while the thick fibres were mostly normal. It is supposed that the fine fibres of the optic nerve are the visual fibres and that the thicker fibres convey the pupillo-motor impulses. Reichardt's observation makes it probable that a lesion may select one group of fibres, while the other escapes, a supposition which receives some support from those cases of retro-bulbar neuritis and of mechanical compression of the optic nerve, in which vision is lost to a greater degree than the pupillary light reflex. Such cases suggest that the thick pupillary fibres are more resistant than the finer visual fibres of the optic nerve. Examples of this kind must be rare, and still more so any condition which would lead to unilateral blindness without ophthalmoscopic signs and without alteration of the pupil reactions. In the latter case we should be justified in suspecting deception. If, however, blindness of both eyes is alleged, the absence of ophthalmoscopic signs and of pupillary changes will not support this suspicion, since we may be dealing with a bilateral lesion of the occipital cortex or optic radiations (bilateral hemianopsia), or perhaps with such a condition as uræmic amaurosis.

Cases have been reported of absolute central scotoma with retained light reflex. Bach and Hess do not accept a "selective" lesion as the explanation of these cases, but hold that there has been failure to ascertain accurately the quality of the scotoma.

The combination of loss of the pupillary light reflex with retention of vision has usually been observed in cases of central scotoma; indeed, Heddäus [2] says that no case of unilateral "Reflex deafness" has been seen in which there was good *central* vision, but if we are correct in assuming the existence of special pupillary reflex fibres in the optic nerve, the possibility of such an occurrence must not be overlooked.

It should be mentioned that in describing amaurotic rigidity of the pupil, Bach states that the pupil of the amaurotic eye is slightly wider than its neighbour, while Heddäus states emphatically that inequality of the pupils never results from a lesion of the centripetal path. The reviewer has seen one or two cases which support Bach's contention. If both sides are affected, the pupils are equal and dilated.

It has already been stated that the lesion which causes amaurotic inactivity of the pupil must lie in the centripetal path of the reflex arc. If the cause lies in the retina or optic nerve it will, in the great majority of cases, be visible on ophthalmoscopic examination. An exception to this rule is found in the case of an injury to the optic nerve behind the point of entrance of the central retinal vessels. There is immediate loss of vision without ophthalmoscopic signs, but the genuine nature of the case is confirmed by the presence of amaurotic rigidity of the pupil. The diagnosis of retrobulbar neuritis is also sometimes rendered possible from the presence of this symptom when ophthalmoscopic evidence is absent or doubtful. This fact has been put forward by Gunn [35] as a help in the differential diagnosis of multiple selerosis from functional diseases, since a retro-ocular neuritis or descending atrophy is often

an early sign of the former. In these cases the pupil symptom may assume a different form, the pupil contracting on strong illumination, but rapidly dilating again in spite of sustained illumination. According to Bach the centripetal reflex path is affected in about a half of the cases of multiple sclerosis, and since it may be for long the only objective symptom, he attributes to it considerable diagnostic importance. Amaurotic rigidity of the pupil is frequently found in syphilis of the central nervous system, being due to involvement of the optic nerve; and in such cases the syphilitic nature of the disease may be confirmed by the disappearance, under antisyphilitic treatment, of the pupil symptom, an event which does not occur in the parasyphilitic diseases.

So far we have been considering lesions of the centripetal path in front of the chiasma. When such are in question the symptom may be unilateral or bilateral, according as the lesion affects the optic nerve or retina of one side or of both. Owing to the partial decussation of the pupillary reflex fibres at the chiasma, a one-sided lesion there or further back cannot produce the symptom we are discussing, but destruction of the chiasma or simultaneous destruction of both optic tracts will cause complete interruption of all the centripetal paths, and therefore bilateral amaurotic rigidity of the pupil. If the symptom indicates a one-sided lesion, that lesion must lie in front of the chiasma, but when it is bilateral we may not be in a position to say which part of the reflex path in front of the external geniculate body is the site of the lesion. A bilateral lesion of the connecting fibres between the optic tracts and the sphincter nuclei would give the picture of bilateral *amaurotic rigidity without amaurosis.*

2. **Hemiopic rigidity of the pupil.** (Wernicke.)—It is commonly stated that the characteristic symptom of *a lesion of one optic tract* is homonymous hemianopsia, associated with the hemiopic pupil phenomenon. The latter is described as follows:—If the hemianopsia is right-sided (blindness of the *left* half of each retina), *illumination of the left half of either retina causes no pupillary contraction, direct or consensual, but illumination of the right half of either retina causes contraction of both pupils.*

To explain this occurrence we must assume: (1) partial crossing of the pupillary reflex fibres at the chiasma, whereby the right optic tract comes to contain all the fibres from the right half of each retina, and the left optic tract all the fibres from the left half of each retina, and (2) an intimate connection between the right and left sphincter nuclei, or, according to Bach's view, a partial decussation of the centrifugal pupillary fibres.

Quite a number of observers claim to have seen the hemiopic pupil symptom. Swanzy[36] says he has seen it twice. Nevertheless, its occurrence is doubted by many careful investigators, among them Heddäus[73], who was one of the first to suggest that such a phenomenon might be found. The reasons for this doubt are two: (1) that only the macula is "pupillomotor," that is, capable of transmitting a light stimulus which will cause pupillary contraction, and that the hemiopic pupil phenomenon is therefore theoretically impossible; (2) that it is practically impossible with any of our available methods to illuminate one half of the retina without allowing diffuse light to fall upon the macula and thus to vitiate the result. The most recent researches, those of Hess[6] and Hesse[7], to lend the strongest support to the opponents of this pupil symptom. Their results show that all the ordinary clinical methods of illuminating one half of the retina allow diffuse light to reach the macula; even most forms of apparatus specially devised for this purpose have the same failing. Moreover, when it is possible to exclude the macula, it is found that it requires the light of a powerful arc lamp to elicit any pupil reflex

through the more peripheral parts of the retina. For these reasons, Hesse believes that the published reports of the hemiopic pupil symptom are valueless.

It has been suggested that a lesion interrupting the pupillary fibres, after they have parted from the visual fibres, that is between the external geniculate body and the sphincter nucleus, would cause *hemiopic pupil rigidity without hemianopsia.* No such case has been reported.

3. The Neurotonic Reaction.—This reaction is mentioned here, as it is supposed to be due to a lesion of the centripetal side of the reflex arc. According to Bach, it occurs in cases in which amaurotic rigidity of the pupil is in process of development. It consists in a *slow contraction of the pupil, coming on only after illumination has been kept up for some time.* The contraction may remain for some seconds, and then slowly pass off. No diagnostic significance seems to attach to the sign.

4. Absolute rigidity of the pupil.—This is also called "total," "complete," or "general" rigidity of the pupil. None of these names is quite appropriate for, as will be seen, the activity of the pupil is not necessarily abolished.

If the condition is unilateral *the affected pupil does not react on illumination of either eye, nor does it contract in near vision. It also fails to dilate on sensory stimulation. It is moderately dilated, and, therefore, appears larger than the normal pupil, but this inequality disappears in the dark.* If the condition is bilateral, both pupils are dilated, and the light, near vision, and cilio-spinal reflexes are absent.

The phenomenon may be incomplete—that is to say, it may take the form of a *reduction* in the activity of the pupil. In that case it will usually be found that the convergence reaction (near vision reflex) is less affected than the light reactions, or the latter may be absent, and the former still obtainable. This may give rise to a false diagnosis of Argyll Robertson pupil. The distinguishing features of the two phenomena will be discussed later. When the symptom is incomplete, a sustained effort of convergence may lead to a slow contraction of the pupil, which, after cessation of the convergence, very slowly passes off (myotonic reaction).

The lesion which causes "absolute" inactivity of the pupil is situated in some part of the centrifugal side of the pupillary reflex arc, that is to say, between the sphincter muscle and the sphincter nucleus, so that we are dealing with a paralysis of the sphincter; although theoretically the symptom might be caused by spasm of the sphincter, or spasm of the dilator pupillæ.

The loss of the cilio-spinal reflex in these cases is not easy to explain, but may result from a spastic condition of the dilator, resulting from paralysis of its antagonist. It may recover through time.

It is not always possible to ascertain which part of the efferent path the lesion involves, but its association with other ocular paralyses may help us. (The use of mydriatics is a very common cause, and must be excluded before proceeding to further investigation of the case). The lesion will be nuclear (or possibly fascicular) if this symptom is uncomplicated with other paralyses, and the same is true of the cases in which there is at the same time paralysis of the ciliary muscle (ophthalmoplegia interna). If to these be added insensibility of the cornea, the lesion is situated in the ciliary ganglion[38].

The use of eserine has been recommended to ascertain whether the lesion is in front of or behind the ciliary ganglion. If behind the ciliary ganglion eserine ought to have its natural effect on the pupil; if in the ganglion or in the short ciliary nerves, eserine should have no effect. This unqualified statement cannot be relied upon, but it is perhaps safe to say that a prompt response to a *weak* solution of eserine places the lesion behind the ciliary

ganglion[39]. It is unnecessary to allude to the various forms of paralysis of the ocular muscles in which paralysis of the sphincter pupillæ may occur, for in these the pupil symptom *per se* has no localising value.

The diagnostic significance of this sympton is not great. It has often been put forward as evidence of the existence of an organic lesion, but the investigations of Bumke[40] throw some doubt on its value in that connection. He believes that the clinical picture of "absolute" inactivity of the pupil can be caused by a cortical impulse, which inhibits the tone of the sphincter, and describes this occurrence in cases of hysteria. Bach is disposed to accept this for the hysterical attack, but considers that the persistence of the symptom in the intervals must be explained on other grounds.

Among the specific causes of absolute rigidity of the pupil, acquired syphilis is by far the most common, and it may give rise to either the unilateral or the bilateral form. It is needless to mention the many diseases in which the symptom has been found; but one may refer to glaucoma and the effect of mydriatic drugs as possible sources of confusion.

5. Myotonic Reaction. - This symptom seems to fall into the group of phenomena caused by "centrifugal" lesions of the pupillary reflex arc. It was described by Saenger[41] as *a very slow recovery of the pupillary contraction brought about by light, convergence, accommodation, or the orbicularis reflex.* When the contracting stimulus is removed the dilatation occupies a period of one half to ten minutes.

Bach describes it as occurring in cases with light reflex abolished, but contraction in near vision still retained. In his view it is simply an incomplete form of "absolute rigidity of the pupil" (q.v.) It must be admitted that the symptom lacks precise definition. It seems to be identical with the "Pupillenträgheit" or Inertia of the pupil, described by Strassburger[42] and from the published examples it would be difficult to separate the neurotonic and the myotonic reactions. Saenger is of the opinion that the lesion is in the iris, that the condition is of the nature of a tonic spasm, and that it is analogous to Thomsen's disease. It is generally stated that it only occurs in the presence of organic disease of the nervous system such as tabes and general paralysis, but the symptom has no other diagnostic significance.

6. Reflex rigidity of the pupil (The Argyll Robertson pupil).—Attention was first directed to this symptom by the late Dr. Argyll Robertson in 1869[43]. Like the other pupillary symptoms, it may be unilateral or bilateral, and is defined as follows.—*The affected pupil does not contract to direct or indirect light stimuli, nor does it dilate on sensory or painful stimulation, but it contracts in near vision,*

It was at first described as an accompaniment of "spinal miosis," and this combination is usually observed, but cases are occasionally seen in which there is absence of the direct and consensual light reflex without abolition of the ciliospinal reflex and without miosis. No satisfactory explanation of the miosis has yet been offered. One would rather expect to find mydriasis in a pupil which fails to respond to light. The most plausible explanation seems to be that of Erb—namely, that a destructive lesion of the sympathetic fibres or centre abolishes the dilatation of the pupil on sensory stimulation, and thus leads to contraction of the pupil.

The Argyll Robertson phenomenon is generally slow in its development, and may therefore be observed in an incomplete form. It may be further advanced in one eye than in the other, or one eye may be normal, while in the other the symptom is well-developed. In either case the pupils will be unequal.

Irregularity in the form of the pupil is also a frequent complication, so

much so, indeed, that deformity of the pupil, apart from local disease or injury, is generally supposed to have the same diagnostic significance as the Argyll Robertson symptom. This is important, since it is often present before the latter has developed. The two explanations offered to account for it are : a lesion of one or more of the long ciliary nerves (Piltz[44]), and local atrophic change in the iris itself (Dupuy-Dutemps[45]).

The Argyll Robertson pupil may be complicated by the loss of pupillary contraction in near vision. Paralysis of accommodation also sometimes occurs. As a rule, the near vision reflex is unusually well marked, especially if one takes into account the already contracted state of the pupil. The same applies to the orbicularis, or lid-closure reflex, which is often easily elicited in these cases, perhaps because of the absence of the interference which would arise from the normal light reaction.

A number of instances have been recorded in which the light reaction returned after a longer or shorter period. In some of these the pupil symptom was an early sign of syphilis. Bach and Uhthoff, while not altogether denying the possibility of such recovery, believe that in most cases there has been faulty observation, more especially where the case has been one of tabes. Mantoux[51] describes a case in which the Argyll Robertson pupil with miosis was present during the occurrence of gastric crises, but passed off in the intervals, and several authors have reported recovery of the light reaction in general paralytics during the remissions. To establish this point, it will be necessary to employ only the most precise methods of examination, and to avoid any want of uniformity in the conditions of the tests.

Want of care in working out the pupil tests may lead to confusion of reflex rigidity, amaurotic rigidity, and absolute rigidity of the pupil. The following points must be borne in mind.—Reflex rigidity and amaurotic rigidity, if bilateral, resemble each other in the absence of pupillary response to light with preservation of the convergence reaction. But the amaurotic form is accompanied by blindness, while in only a small percentage of cases is the Argyll Robertson pupil so complicated. Moreover, the latter is usually complicated with miosis, while the former is more likely to show dilated pupils. Again, the near vision reflex is often unduly active in the reflexly rigid pupil. Typical examples of reflex rigidity and absolute rigidity are easily distinguished from one another, since in the latter the convergence reaction is wanting, but it may be difficult or impossible to distinguish the Argyll Robertson pupil from the incomplete form of absolute rigidity in which a convergence reaction is obtainable. This incomplete form of amaurotic rigidity is observed, either when the symptom is recovering, or more frequently, when it is in process of development, and its resemblance to the Argyll Robertson symptom has probably led to the opinion that the latter may develop into absolute rigidity of the pupil. Bach maintains that this does not occur, and that the two phenomena are entirely distinct. If this can be proved, it will have some importance from the point of view of general diagnosis, for the Argyll-Robertson phenomenon in the vast majority of cases is an evidence of tabes, general paralysis, or tabo-paralysis, whereas the absolutely rigid pupil occurs in a very wide variety of diseases and has relatively little diagnostic value. The distinction between the two symtoms must rest chiefly on the presence or absence of miosis and on the state of the near vision reflex. In the incomplete form of absolute rigidity the near vision reflex, if present, is deficient or may show the "myotonic" character, whereas in the Argyll Robertson pupil the convergence contraction is, if anything, unusually well-marked.

Prolonged researches by many workers have failed to find an explanation of the Argyll Robertson phenomenon which meets with general acceptance. When we bear in mind the ignorance which still prevails as to the parts of the central nervous system concerned with the various pupillary movements, we are not surprised to find that many hypotheses have been put forward, based on anatomical conceptions which are quite unsupported by facts. One is bewildered, however, by the array of widely contradictory results obtained by careful microscopic examination of the central nervous system in cases which presented this symptom during life.

For years the attention of pathologists was devoted to the central gray matter in the neighbourhood of the third nerve nucleus, and different workers described changes in the corpora quadrigemina, the Edinger-Westphal nucleus, the fasciculi leaving the oculo-motor nucleus, the ganglion habenulæ, the pulvinar, etc.

Marina[46] has turned his attention to the ciliary ganglion and ciliary nerves, and finds changes there constantly associated with the presence of the Argyll Robertson pupil.

The latest researches have dealt chiefly with the condition of the medulla and spinal cord. Wolff[47], Gaupp[48], Reichardt[49], and others have brought forward very strong evidence in favour of a direct association of the Argyll Robertson pupil with changes in the posterior columns of the cord, more particularly of Bechterew's intermediate zone (between Goll's and Burdach's columns) about the level of the third cervical segment. Other equally reliable observers like Fürstner[50] have found the same changes in the absence of the Argyll Robertson pupil, and have seen the cord free from changes where the symptom has been present.

Experimental researches, such as those of Bach and Meyer, do not enable us to arrive at any settled conclusions.

To come to the clinical significance of the Argyll Robertson pupil, its close association with locomotor ataxy and general paralysis is a very familiar fact; so much so, indeed, that one is apt to overlook the possibility of its occurrence in other connections. Probably tabes, general paralysis, and tabo-paralysis between them account for more than 90 per cent. of all cases of Argyll Robertson pupil. It is well to bear in mind, however, that twenty or thirty other diseases could be mentioned in which the symptom has been more or less frequently observed. To refer to these in detail, however, would be to give them an importance in this connection to which they are not entitled. This symptom never occurs apart from organic disease.

The diagnostic value of the Argyll Robertson phenomenon is receiving renewed attention on account of the recent publications of French authors, in which the intimate relationship between this symptom and syphilitic disease has been brought to light. A series of articles by Babinski and Charpentier[52], Cestan and Dupuy-Dutemps[53], and others, maintain that the Argyll Robertson pupil is always a sign of antecedent syphilis, acquired or inherited. It has been observed as the sole objective sign in syphilis within three months of the primary sore. When it occurs in patients presenting evidence of aortic aneurysm, Babinski would explain it on the ground that the same ætiological factor, syphilis, underlies the aortic disease and the pupillary change.

While some authors still hold that the Argyll Robertson phenomenon may be found in patients who have never had syphilis, there is a tendency to accept with very little, if any reservation, the statement that this symptom is evidence of antecedent syphilis. The point is still under discussion, whether it is to be looked upon as a syphilitic or a parasyphilitic affection, a question which has an important bearing on the diagnostic and

prognostic value of the sign. As already mentioned, it has been seen as an early symptom of constitutional syphilis, but in the great majority of cases it occurs years after infection. As J. Mitchell Clarke has pointed out in a recent paper [54], if it merely indicates a syphilitic infection its importance is but slight, whereas if it points to the presence of degenerative changes, like those underlying tabes and general paralysis, it must always be a serious symptom. Contrasting the known frequency of the Argyll Robertson pupil in tabes and general paralysis with its total absence in thirty-seven cases of gross syphilitic disease of the central nervous system which he has had under observation he inclines to favour the latter view.

7. **The paradoxical light reaction.**—This symptom is described as *contraction of the pupil on shading the eye and dilatation on illuminating the eye.* True examples of the phenomenon are extremely rare, in the experience of careful investigators. There is reason to believe that in some of the published cases the lid closure reaction, the reaction to sensory stimuli and other sources of pupillary movement have not been excluded. The subject is discussed at length in a paper by Piltz[55], and many authors have tried to account for its occurrence.

The researches of Anderson[26] brought out the interesting fact that in animals from which the superior cervical ganglion of one side had been excised the pupil of the operated side became wider than the normal pupil, under certain conditions, when exposed to a bright light. This is attributed to an increased excitability of the unstriped muscle fibre which has been deprived of its ganglionic connection. With this may be compared the case observed by Bach [56] in which the paradoxical pupil reaction was associated with signs of paralysis of the cervical sympathetic on the same side. The subject seems to deserve further investigation, but at present no diagnostic value can be attached to this symptom.

Disturbances of the Near Vision Reflex.

1. **Failure of the near vision reflex.**—Loss of this reflex has already been mentioned as a part of the symptom described as "absolute rigidity of the pupil" but just as the light reflex may fail while the near vision reflex remains (Argyll Robertson pupil), so some cases have been seen in which the near vision reflex alone was lost. Morax[3] denies that this ever occurs. Heddäus[2] says that it is easily overlooked, and is probably more common than is generally supposed. Bach[1] doubts its occurrence as an isolated symptom due to a lesion of the centrifugal pupil-contracting path, but points out that it occurs alone in those cases in which the faculty of convergence is in abeyance, in which cases it is probably due to a lesion which breaks the path between the cerebral cortex and the oculo-motor nucleus.

2. **Perverse near-vision reflex.**—This is analogous to the paradoxical light reaction, in that the *pupils dilate in fixation of a near object and contract with relaxation of convergence and accommodation.* Two such cases have been recorded, one in a case of traumatic neurosis, the other during migrainous attacks.

Disturbances of Reflex Dilatation of the Pupil.

1. **Loss of the cilio-spinal reflex** has already been mentioned as a regular accompaniment of the "absolutely rigid" and "Argyll Robertson" pupil symptoms. In the former case we are dealing with a paralysed oculomotor nerve. Since the cilio-spinal reflex is due to inhibition of the third nerve tone,

paralysis of the third nerve abolishes the reflex. This explanation does not hold for the loss of the cilio-spinal reflex which accompanies the Argyll Robertson phenomenon. Bach supposes the lesion in that case to be in the cortex of the brain or in the paths between the cortex and the oculo-motor nucleus.

Loss of the cilio-spinal reflex may result from a lesion of the sympathetic supply to the iris, at any point between the cilio-spinal centre and the nerve terminals, but it has been repeatedly observed that removal of the superior cervical ganglion in animals, or in man (for the relief of glaucoma), does not permanently abolish the cilio-spinal reflex.

While the loss of this reflex has no precise diagnostic significance, it is probably most frequently observed as an accompaniment of the Argyll Robertson phenomenon in tabes, general paralysis, and syphilis of the central nervous system.

2. **Absence of the normal pupillary oscillations** often occurs in the same conditions.

3. **Undue activity of the cilio-spinal reflex and exaggeration of the normal pupillary oscillations** have been described in some of the neuroses, such as hysteria, and in certain stages of alcoholic intoxication.

Hippus.

It has already been remarked that this symptom should be carefully distinguished from the normal pupillary oscillations described in an earlier part of this Review. True hippus consists of *rhythmic movements of the iris, occupying on the average a period of one to three seconds, independent of illumination, convergence, and sensory and psychical impressions,* and, with an average amplitude of two or three millimetres. As a rule, the symptom is bilateral. It has been seen in a large number of different diseases, but most frequently in cases of multiple sclerosis. It cannot be said to have definite diagnostic value. The seat of the lesion which causes it is still matter for speculation.

According to Knies[38], it is sometimes seen in cases recovering from paralysis of the third nerve, and is then apt to be associated with nystagmus. If seen as an independent lesion in diseases like tabes and multiple sclerosis, it is a forerunner of the Argyll Robertson pupil.

See-Saw Pupils.

This term ("*Springende pupillen*" of the Germans) is still in need of more precise definition. Bach [1] says the term is used in reference to three groups of cases. These are: (1) cases with unequal pupils, in which the relative sizes of the pupils become reversed at longer or shorter intervals. Usually, there is mydriasis which affects each pupil in turn, the change occurring hourly or daily. The pupillary reactions are intact, and miotics and and mydriatics give the usual results; (2) cases in which one pupil (the normal one) changes in size according to illumination, etc., while the other pupil remains fixed. There is paralysis of the sphincter on the affected side, and in consequence of the alterations in size of the normal pupil, it is at one time larger, at another smaller than its fellow; (3) cases in which one pupil (the abnormal one) undergoes notable changes of diameter, which are independent of illumination and convergence, so that the abnormal pupil is now wider, now smaller than the normal one. In most reported cases of this kind there has been a

congenital paralysis of the third nerve, and the pupillary movements have been associated with contractions of one or other of the muscles supplied by the defective nerve, *e.g.*, adduction of the eye or raising of the lids.

This symptom appears to have no diagnostic value. Bach thinks it is due to a lesion between the third nerve nucleus and the cerebral cortex.

Abnormalities of the size of the Pupils.

Abnormally small pupils. —Miosis may result from irritation of the pupil-contracting mechanism (spastic miosis) or from paralysis of the pupil-dilating mechanism (paralytic miosis).

Spastic miosis is found in local disease (iritis, and conditions with photophobia), in inflammatory affections of brain and meninges, in cerebral hæmorrhage, and intracranial conditions causing irritation of the third nerves or their nuclei. It also occurs as the result of prolonged accommodative efforts or as an accompaniment to spasm of accommodation. In this form the pupils are very small. Contraction to light or in near vision and dilatation in the shade are abolished or very slight. Miotics cause slight contraction and mydriatics cause maximum dilatation.

Paralytic miosis as a bilateral symptom, is practically synonymous with the so-called spinal miosis, which is so well known as an important sign of tabes dorsalis Other occasional causes, such as poisoning by opium, pontine hæmorrhage, etc., are not likely to cause any difficulty in diagnosis, and thus bilateral miosis comes to have a very important diagnostic value, and should always arouse suspicion and lead to further investigation. Mott [57] tells of a case admitted to Hospital for operation on account of severe abdominal pains supposed to be due to acute intestinal obstruction. The surgeon's attention was attracted by the pupils which were very small, and did not dilate during the paroxysms of pain. Examination showed that the case was one of locomotor ataxy.

Paralytic miosis differs from spastic miosis in that mydriatics fail in the former case to dilate the pupils. The cilio-spinal reflex is absent.

Many theories have been offered to explain the occurrence of miosis in locomotor ataxy. It has been attributed to diminution of the sympathetic innervation (Romberg), to a lesion of the cilio-spinal centre (Budge), to interference with the sympathetic path in the spinal motor roots, or in the cervical sympathetic (Uhthoff), to vasomotor disturbance in the iris from a medulla lesion (Berger), to absence of the cilio-spinal reflex (Erb), etc. Other views would make it out to be a spastic miosis. None of these explanations is free from objections, and the subject requires further investigation.

Abnormally large pupils.—Mydriasis.—This condition may be due to irritation of the pupil-dilating mechanism (spastic mydriasis) or to paralysis of the pupil-contracting mechanism (paralytic mydriasis).

Spastic mydriasis is uncommon. It occurs in conditions which lead to irritation of the cervical portion of the spinal cord and its meninges, as a result of continued peripheral irritation (for example in the presence of intestinal worms), and in cases of psychical excitement (mania, hysteria, etc.). It has been mentioned as a premonitory symptom of tabes.

In this form of mydriasis there is slight contraction of the pupils to light and in near vision, but no dilatation on sensory stimulation, mydriatics produce full dilatation, but cocaine does not, and the action of miotics is limited.

Paralytic mydriasis may result from any lesion which causes an interruption of the continuity of the light reflex arc, and has already been mentioned as

an accompaniment of amaurotic rigidity and absolute rigidity of the pupil. In the former, since the lesion is in the centripetal side of the arc, the direct light reaction will be absent, while the consensual reflex and the convergence reflex are present. (If bilateral there will be no light reaction). In absolute rigidity of the pupil, in which the lesion is in the centrifugal side of the reflex arc, all reflexes are absent. In both cases mydriatics (including cocaine) produce maximum dilatation, but miotics have only a limited action.

Paralytic mydriasis is a fairly constant symptom in compression of the brain, in the late stages of the different forms of meningitis, and during the progress of an epileptic fit. It occurs sometimes in tabes, general paralysis, and syphilis of the cerebro-spinal system. It is disputed whether the mydriasis of hysteria can ever be of a paralytic nature.

The foregoing remarks on miosis and mydriasis apply especially to cases in which the conditions are bilateral, and the pupils therefore equal. One-sided alterations in the size of the pupils are more common, and can be discussed more appropriately in the next section.

Inequality of the Pupils (Anisocoria).

Inequality of the pupils is easy to detect, since an appreciable difference of diameter need not amount to more than a quarter of a millimetre. By attracting the attention, it often leads to investigation of the pupillary reactions, and may thus be the means of discovering more important abnormalities which might otherwise have been overlooked.

The statement, which is often made, that inequality of the pupils is always pathological, cannot now be upheld. It has been conclusively shown that slight degrees of inequality occur quite frequently in healthy persons, and even well-marked anisocoria occasionally occurs as a congenital peculiarity of no pathological significance. The latter may appear in several members of a family. In these cases the inequality is not associated with any disturbance of the reactions, and the difference in size persists in all states of illumination, convergence, etc.

Another benign cause of inequality is a difference in the kind or degree of refraction in the two eyes, chiefly noticed when one eye is highly myopic, the corresponding pupil being wider than its fellow. The inequality does not vary with alteration of the conditions of the examination and the reactions are normal, but Bach has sometimes found that in a highly myopic eye the direct light reaction, and in its neighbour the consensual reaction, are diminished in activity. Heddäus denies the occurrence of anisocoria as a symptom of uncomplicated refraction anomalies. It was mentioned in an earlier part of this paper that Bach, Pick, Elschnig, and others have found that with monocular illumination the pupil of the illuminated eye is smaller than the other, and that Heddäus does not agree with these authors.

Pathological inequality of the pupils is an evidence of one-sided, or bilateral but unequal miosis or mydriasis. Since, apart from local disease, spastic miosis and mydriasis are very uncommon, we are practically dealing with lesions which interfere with the afferent and efferent sides of the light reflex arc or with the sympathetic supply to the iris.

If the inequality is the result of one-sided interference with the afferent path for the light reflex, the pupil on the affected side will be the larger, and will present the features characteristic of " amaurotic rigidity." The condition of the visual field and visual acuity will help to indicate the site of the lesion, and the inequality will be diminished during the act of convergence. Mydriatics and miotics will have their usual effects. The inequality will, of

course, be best seen on alternate illumination of the eyes, and may not be noticed by binocular illumination. When the inequality is due to a one-sided lesion of the efferent side of the reflex arc, there will be no visual disturbance, the difference of size may disappear in the shade, and it will be more marked in convergence. We are here dealing with one-sided "absolute rigidity" of the pupil, whose characters have already been described.

These two forms of anisocoria are the most frequent and the most important, and, as can be seen, are not difficult to distinguish from one another. Anisocoria from one-sided Argyll Robertson pupil is also easy to diagnose from an investigation of the pupil reactions.

Inequality, due to paralysis of the sympathetic supply on one side (paralytic miosis), will be seen best in the dark, the affected pupil failing to dilate. In these cases the dilatation on sensory stimulation is often absent. Cocaine causes no dilatation. It is said (Meltzer[58]) that after excision of the superior cervical ganglion, instillation of adrenalin causes the pupil to dilate, an effect which it does not produce in the normal pupil. Inequality of this kind may be accompanied by other symptoms of sympathetic disturbance on the same side as the miotic pupil.

Anisocoria has thus no specific diagnostic significance, but if it is accompanied by alterations of the pupil reflexes, it may be taken as evidence of an organic lesion. It is very common in tabes and general paralysis and less frequent in multiple sclerosis. Syphilis being the most common cause of unilateral mydriasis is therefore an important cause of inequality of the pupils. In cerebral hæmorrhage, leading to compression of the brain, dilatation of the pupil may be observed on the affected side. Anisocoria may be considered to have some value in the diagnosis of syringomyelia, for it occurs in a considerable proportion of these cases, while it is absent in the conditions for which they are likely to be mistaken (amyotrophic lateral sclerosis and progressive muscular atrophy).

The site of the lesion in injury of the spinal cord may be indicated by the presence of pupillary symptoms due to involvement of the ciliospinal centre or its efferent nerves, and the inferior form of paralysis of the roots of the brachial plexus (Erb) is distinguished by the presence of pupillary symptoms of the same kind.

Within recent years a number of authors, Massolongo[59], Deherain[60], Souques[61], and others, have pointed out the frequency of inequality of the pupils in diseases of the lungs and pleura. Probably the fact has no diagnostic or prognostic value, but a knowledge of the possibility of its occurrence may prevent anxiety, as in a case of pleurisy in a child recently seen by the reviewer, where the presence of anisocoria, along with some head symptoms, made the diagnosis doubtful for a day or two.

As already stated, the inequality of the pupils seen in cases of aortic disease is not to be attributed to direct interference with the sympathetic supply to the iris, but is looked upon as a sign of the syphilis which was the cause of the vascular disease.

Changes in the form of the pupil.

Apart from such local diseases as iritis and glaucoma, these are practically confined to tabes, general paralysis, and cerebro-spinal syphilis. They are therefore considered by Piltz[44] and others to indicate the presence of syphilitic or parasyphilitic disease. In tabes, deformity of one or both pupils may appear before the Argyll Robertson pupil or any of the other symptoms, and it has therefore some diagnostic value.

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CURRENT LITERATURE.

NOTE. Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—BACTERIOLOGY.

(1) McKee, S. Hanford.—The cultivation of the meningococcus from eye conditions complicating epidemic cerebro-spinal meningitis. *Montreal Medical Journal*, December, 1908.

(2) McKee, S. Hanford.—Ulceration of the cornea: some points in etiology and treatment. *Montreal Medical Journal*, February, 1909.

(3) McKee, S. Hanford.—Another case of meningococcus conjunctivitis. *Ophthalmic Record*, June, 1909.

(1) This paper by **McKee** (Montreal), which, in essence, concerns the finding of the meningococcus in three out of seven cases of eye affection complicating epidemic cerebro-spinal meningitis, draws attention strongly to the difficulty in identifying the meningococcus, and shows that many cases reputed to be meningococcic cannot be accepted as such, because proof of study of the organisms sufficient to identify them has not been brought forward. So much careless eye bacteriology has gone on record, it is high time we demanded from ophthalmologists the same proof of the results we receive

from others. In discussing Gram-negative diplococci found in the eye, it is necessary to differentiate between the gonococcus, the micrococcus catarrhalis, and the meningococcus. The staining of Gram-negative bacteria, and especially of the meningococcus, requires special *technique* and great care. In order to differentiate the Gram-negative diplococci of the conjunctiva, even in cases of epidemic meningitis, a study of the cultural features of the organism is necessary. These cultural features of the above three Gram-negative diplococci may be given here in full:—

Where Gram-negative diplococci grow at room temperature and are viable on plain agar for weeks or months, the gonococcus and the meningococcus are excluded. The micrococcus catarrhalis is so easily differentiated that the question comes to be really a discussion between the gonococcus and the meningococcus. (1) In the initial tube a growth of the meningococcus upon plain agar is not rare, whereas a growth of the gonococcus upon this medium is. (2) Upon hæmoglobin-agar the meningococcus grows profusely with a large raised growth which has somewhat of a bluish tinge. The gonococcus, on the other hand, has a fine slightly raised moist-looking colourless growth. (3) Upon blood serum the meningococcus grows fairly well, the gonococcus does not. (4) Upon potato the meningococcus grows at times, the gonococcus never. (5) In bouillon the meningococcus grows with turbidity of the medium, the gonococcus does not grow. (6) In litmus milk the meningococcus sometimes gives a slight growth, the gonococcus never. (7) The meningococcus ferments maltose and dextrose, the gonococcus only dextrose. (8) Neither of them grows on gelatine, as a rule. Thus, it is seen that when their cultural features are compared the two organisms give ample ground for differentiation.

Of the seven cases of epidemic cerebro-spinal meningitis with ocular symptoms seen at the Montreal General Hospital in the course of a year, one presented metastatic ophthalmia (hypopyon-iritis) and six conjunctivitis. From the pus in the anterior chamber of the former, and from the conjunctiva in two of the latter, were cultivated Gram-negative diplococci, which were carefully studied and shown to be meningococci.

In one case McKee has proved (by the aforementioned tests) the presence of the meningococcus on the conjunctiva of the *normal* eye. He believes it to be the first case reported, but quotes Brons as having been the first to report the meningococcus from the conjunctival sac of a patient not ill with meningitis. A score of references to literature completes the article.

ERNEST THOMSON.

(2) **McKee's** short paper constitutes a plea for the bacteriological examination of corneal ulcers in all cases. The clinical diagnosis is incomplete without the bacteriological one. More particularly we require to determine whether the ulcer is due to the pneumococcus or diplo-bacillus, for it is now known that the latter organism can give rise to ulceration as severe in type as the *ulcus serpens* of pneumococcus infection. In pneumococcus ulceration we have an exceedingly virulent process to combat. In diplo-bacillary infection we have a pathological condition easily controlled and cured (by sulphate of zinc). McKee gives an analysis of 41 cases of corneal ulcer taken consecutively in Montreal. Of these 41 cases, 21 were due to the diplobacillus Morax-Axenfeld, 2 to the gonococcus, 8 to the pneumococcus, 2 to the streptococcus pyogenes, 3 to the staphylococcus aureus, 2 to the staphylococcus albus, and 2 were not due to bacterial infection.

ERNEST THOMSON.

(3) **McKee** (Montreal) examined bacteriologically the secretion from a case of conjunctivitis in a girl, aged 13 years, who after severe headache

lasting for two days, had become unconscious. In addition to other micro-organisms, he found a Gram-negative diplococcus, which in morphology, cultural features, and sugar reactions was identical with the meningococcus cultivated upon two occasions from the patient's cerebro-spinal fluid.

SYDNEY STEPHENSON.

II.—EPIDEMIC PNEUMOCOCCAL CONJUNCTIVITIS.

(1) **Adams, P. A.—An epidemic of contagious conjunctivitis due to the pneumococcus.** *Transactions Ophthalmological Society U.K.*, Vol. XXVIII, 1907-8.

(2) **Stanculeanu, G.—A little epidemic of pneumococcal conjunctivitis in the family of a patient with pneumonia. (Une petite épidémie de conjonctivite à pneumocoques dans la famille d'un pneumonique.)** *La Clinique Ophtalmologique*, 10 juin, 1909.

(1) Most cases of epidemic and contagious conjunctivitis are due to the Koch-Weeks' bacillus. **Adams** (Oxford) describes a pneumococcic school epidemic, giving full clinical and bacteriological details. The epidemic agreed with those already described in most respects, *viz*:—It occurred in spring, followed a mild outbreak of influenza, and attacked children only.

ERNEST THOMSON.

(2) **Stanculeanu's** "epidemic" though "little" is interesting. A medical man fell ill with pneumonia. A week later his wife was attacked by pneumococcal conjunctivitis, which under treatment got well in three days. Twenty-four hours after the mistress was cured, a servant—the chambermaid—took pneumococcal conjunctivitis, which lasted four days in one eye, and twenty-four hours in the other. The secretion from the eye of the mistress and maid contained encapsulated pneumococci. Why is such infection so rare? Is the pneumococcus of pneumonia different from that of conjunctivitis? "Our case, like those of Hallé (*Ann. d'Oculistique*, T. CXXIII, p. 200), shows the identity of the pneumococcus of the pulmonary disease with that of conjunctivitis," and Stanculeanu concludes that the conjunctiva is a poor medium for the culture of this micro-organism and attenuates its virulence.

ERNEST THOMSON.

III.—SPOROTRICHOSIS.

(1) **Morax, V.—Sporotrichosis of the visual apparatus. (La sporotrichose de l'appareil visuel.)** *Ann. d'Oculistique*, T. CXLI, p. 321, mai, 1909.

(2) **Fava, A.—A case of primary sporotrichosis of the conjunctiva and eyelids. (Un cas de sporotrichose conjonctivale et palpébrale primitives.)** *Ann. d'Oculistique*, T. CXLI, p. 338, mai, 1909.

(3) **Burnier.—A case of gummatous hypodermic ulcerating disseminated sporotrichosis with conjunctival lesions.** (**Un cas de sporotrichose gommeuse hypodermique ulcéreuse disséminée avec localisations conjonctivales.**) *Ann. d'Oculistique*, T. CXLI, p. 344, mai, 1909.

(4) **Aurand. L.—Researches upon experimentally induced sporotrichosis of the eye.** (**Recherches sur la sporotrichose oculaire expérimentale.**) *Rev. Générale d'Ophtalmologie*, juin, 1909.

(1), (2), and (3). In an article which appeared in the *Annales d'Oculistique* for June, 1908 (T. 139, p. 418),* Morax and Carlotti recorded two cases of inflammation of the eyelids due to infection with sporotricha, and gave a further instances of known varieties of that group of organisms. Since then description of the sporotrichosis have been observed, and the following ocular cases were recorded in the *Annales d'Oculistique* for May, 1909:—

Case 1.—Marie F——, a married woman, aged 38, was first seen at the Larboisière Hospital on December 22nd, 1908, when she complained of a growth near the right caruncle which caused no irritation, and was stated to have commenced to come a few days previously. A small pedunculated tumour was removed. Two days later the patient noticed some fresh growths similar to the first one, and also that her preauricular and cervical glands were enlarged. As the eye became irritable, she returned for treatment on December 28th, when there was found slight swelling of the lids, especially the nasal half of the lower lid, injection of the caruncular region with a slight wateriness of the eyes, fleshy swelling of the semilunar fold with white spots on it resembling suppurating or caseating follicles, with slight superficial ulceration of the largest of those spots. There was one small spot on the lower tarsal conjunctiva similar to those on the caruncle. The bulbar conjunctiva and cornea were normal. On puncture of one of the white spots no pus was found. The preauricular gland was the size of a small hazel nut and slightly tender on pressure, and the lateral cervical glands could be felt and were also a little tender. A puncture was made in the diseased region, and a specimen removed with a pipette, from which smears were made and tubes of ascites agar were inoculated. No organisms were found in the smears. Lotions and hot applications were prescribed. On December 31st, as the eye was worse, it was painted with a 3 per cent. solution of silver nitrate, after fresh cultures had been taken. On January 2nd, 1909, the preauricular gland was less tender, but the state of the eye was unaltered. The semilunar fold was removed, and the raw surfaces and the palpebral ulcerations were touched with the galvano-cautery. The excised mucous membrane was divided into four parts. One of them was used to inoculate several tubes of ascitic-agar; one was fixed in formol for impregnation with silver nitrate; one was fixed in Zenker's fluid; and, lastly, one was inoculated under the skin of the abdomen of a guinea-pig. On January 9th the lesions were partially cicatrised, but there was some deep induration beneath them, and near the external commissure on the tarsal conjunctiva of the upper lid there was a small, yellowish-white, ulcerated spot, which caused the patient some discomfort. The cauterisation was repeated. On January 14th, as sporotricha had been found in the cultures, the patient was given two grammes of potassium iodide daily. This was borne well, but did not produce much effect for about ten days, after which rapid improvement set in, and by February 1st the conjunctiva was perfectly normal and the patient was

* Reviewed in THE OPHTHALMOSCOPE, Vol. VI, p. 973, December, 1908.

regarded as cured. Examination of a specimen of blood taken from the forearm showed a slight excess of eosinophile cells above the normal 3 per cent., while its serum, introduced into a culture of sporotrichum Beurmanni, caused marked agglutination in a few minutes in a strength of 1 in 10, and in half an hour in a strength of 1 in 200. Control experiments with tuberculous and normal serum caused no agglutination. On March 5th, 1909, the serum of the patient in a strength of 1 in 30 required an hour to cause agglutination. The bacteriological examination gave the following results.—On the days following the inoculation, no pathogenic growths were present, but on the 12th day the tube taken on January 2nd was found to contain, at fairly regular intervals, a number of colonies forming rounded spots with festooned edges and yellowish-white surfaces which had slightly pointed centres and penetrated a little into the media. Similar colonies were found in one of the tubes inoculated on December 28 and 31. The consistence of the colonies was not so dry as it appeared, and smears were found to contain mycelium elements mixed with rounded bodies, both staining by Gram's method. The parasite was identified as a sporotrichum by means of the following subcultures :—1. On glycerinated potato at 18° or 36° C. thick creamy colonies with bosselated surfaces formed in about the same time. 2. On non-glycerinated potato the growth was a little more abundant, and in a week the colony projected at least 2 mm. and had a black colour. 3. On coagulated horse serum the colonies resembled those of ascites-agar, but the development was less abundant. 4. In peptonized bouillon the colonies grew well and collected in the bottom of the tube, forming a greyish deposit which, on shaking, separated into a series of small rounded flakes. 5. Milk was not coagulated by the parasite which grew well in it, but in a fortnight the superficial creamy layers along the edges of the tube were coloured black. 6. In media containing glucose and maltose the parasite grew, but did not cause manifest fermentation. In all the subcultures the growths showed on the fourth or fifth day, *i.e.*, not so soon as in the case of sporotrichosis palpebralis previously reported. Hypodermic injections of cultures in the thigh, the tail, and the ear of mice caused in the two first-named the development, in ten days, of thickening of the skin with ulceration, smears from which showed in great abundance the shuttle bodies which are characteristic of the parasite in experimental ulcerations. Injections of cultures under the skin of the ear and of the eyelid in guinea-pigs caused, after an incubation of 8-10 days, ulcerous lesions covered with crusts, which ran a chronic course. The guinea-pig, inoculated with a piece of the semilunar fold, showed no sign of local or general lesion. Interesting results were obtained by Fava from sub-conjunctival and intra-corneal injections in rabbits, which will be described in a separate article.

In his previous article, **Morax,** relying on a supposed difference in the rapidity of growth of the two varieties, expressed the opinion that the parasite isolated was the sporotrichum Schenkii, but Pinoy, of the Institut Pasteur, has shown that different strains of the sporotrichum Beurmanni develop at different rates, and that the distinction between that organism and the sporotrichum Schenkii depends on the following characters.—The sporotrichum Beurmanni grows in filaments, which are covered with conidia, and cross each other, so as to form meshes, and causes pigmentation of the cultures, but no fermentation, while the sporotrichum Schenkii grows in parallel filaments which have few conidia, and do not form meshes, and its cultures are shining white in appearance and cause fermentation. Morax, accordingly, is now of opinion that both in the case at present under consideration and in the previous one the disease was caused by infection with sporotrichum Beurmanni.

The microscopic examination of the portion of excised conjunctiva, impregnated with silver nitrate, showed that there was no trepanomata present. Sections of the piece of excised conjunctiva fixed in Zenker's fluid, coloured with various stains, showed that the infiltration tissue consisted of mononuclear cells with a considerable amount of protoplasm surrounding giant cells, one of which contained a rounded highly refractive body, which did not take the stain, and which appeared to be a sporotrichum spore. This was the only element found which appeared to be foreign to the organism, a fact which must be regarded as surprising considering the ease with which the parasites were cultivated.

Case II.—The case of Attilio **Fava**, as recorded by himself, is one of the greatest interest, as it practically amounts to a history of an attack of sporotrichosis produced experimentally in a human being. Fava, an Italian doctor, aged 30 years, and of good general health, was engaged on March 11th, 1909, in experimental research on ocular sporotrichosis at the Institute Pasteur on the suggestion of Morax, when in making an injection of a 20 days' old culture of sporotrichum Beurmanni into the vitreous of a rabbit, the needle of the syringe broke and some of the virulent fluid was squirted on to his face and eyes. Fava did not at once cleanse the parts, but in half an hour he thoroughly washed out his eyes with 1 in 4000 solution of oxycyanide of mercury. As a result of this accident, he developed conjunctival lesions in the right eye on the 11th day and palpebral lesions in the left on the 15th day. The conjunctival lesions were characterised by yellowish-white spots occurring in a region of thickened conjunctiva, infiltrated with some follicles. These spots, from which cultures of the parasite were easily obtained, were the seat of slight tenderness and caused a sensation as if a foreign body were present. The lesions were accompanied by a slight degree of palpebral œdema and conjunctival hyperæmia, and enlargement of the angulo maxillary and preauricular glands on the same side was present from the start. The palpebral lesion was characterised by an ulcerative folliculitis restricted to the follicle of the first eyelash of the upper lid, and was accompanied by limited œdema of the eyelid with erythema, followed by slight desquamation. There was no glandular enlargement on the side of the palpebral lesions. The conjunctival lesions began to improve three days after the commencement of treatment with potassium iodide and the improvement was marked on the 7th day of treatment but on the 75th day there still remained some slight conjunctival alterations, although the glandular enlargement had almost entirely disappeared, which seemed to indicate that the infective process was at an end. There was definite marked eosinophilia both in the blood (6 per cent. to 8 per cent.) and locally, and agglutination of the spores was very manifest. Cultures were easily obtained from the surface of the lesions, and the recognition of the parasite in scrapings taken on the second day from the streak on the surface of the culture medium on which the inoculation had been made allowed of the early establishment of a definite diagnosis.

Case III.*—Och.——,aged 30, was admitted to the St. Louis Hospital, Paris, on 10th February, 1909. He gave a history that he had noticed a little lump at the external angle of the left eye a year previously, which spread by degrees, and that subsequently lesions had developed all over his body. He was, in fact, covered with cutaneous ulcerations involving the head, trunk, and limbs. The facial lesions were situated around the left eye, and consisted in

*G. Thibierge and P. Gastinel.—Trois cas de sporotrichose dermo-hypodermique, dont un avec lésions du pharynx du larynx et du tibia. *Bulletins et Mémoires de la Soc. méd. des Hôpitaux de Paris.* Séance du 13 mars, 1909, p. 537, quoted by Morax.

a crescentric ulceration extending from the external angle of the eye to the base of the nose and involving the entire lower lid and part of the malar region. The ulcer was very superficial, and its edges, which were surrounded by a narrow reddish zone, were directly continuous with its surface without any undermining. The surface was covered in places by dry brownish crusts usually thin, but had, as a rule, a varnished appearance, with numerous hemispherical prominences of varying sizes, giving a very marked papillomatous appearance. The free border of the lid was infiltrated and thickened but not ulcerated, the cilia were absent, and there was slight ectropion. After removing the crusts, it was seen that the papillomatous appearance extended over the entire surface of the ulcer. On the upper lid there were two softened gummata, of a brownish-red colour, slightly tinted with violet, situated alongside of each other, and having together the size of a small bean. The palpebral conjunctiva throughout its entire extent was red. In spite of the extensive cutaneous lesions, the only involvement of the lymphatic system which could be discerned consisted in the presence in the left axilla of three or four enlarged glands, the size of which did not exceed that of a bean, but there was ulceration of the laryngeal and pharyngeal mucous membrane, with swelling, and the presence of numerous hemispherical prominences.

Culture of pus from an ulcer on the arm gave, after four days, at a temperature of 20° C., a growth of sporotrichum differing in some respects from the sporotrichum Beurmanni. Treatment with iodides resulted in perfect cure.

Case IV.—A. V.——, aged 16 years, previously healthy, had an attack of influenza about September 15th, 1907, after which he developed a number of subcutaneous nodules which were slightly tender, and felt like cherry stones beneath the skin. These were situated—three on the left hand and arm, and one in the retro-auricular region, and they grew gradually until they reached the size of cherry stones, when they softened; and at the end of three or four weeks those on the hand and arm ulcerated, leaving fistulæ, through which a whitish serous fluid discharged. One of these healed up, but the others continued to discharge. The swelling behind the ear was incised, after which it healed rapidly. About October 25th, 1907, the eyelids on both sides became red and swollen. On the right side there were three hard painless nodules in the middle and outer part of the lower lid, raising the conjunctiva, which was healthy; one similar nodule in the upper *cul-de-sac* and one enlarged gland the size of a hazel nut in front of the ear. On the left eye: There were four or five nodules the size of pin heads covered by healthy conjunctiva in the lower *cul-de-sac*, but there was no glandular enlargement. Under treatment with silver nitrate and the galvano-cautery, the ocular lesions healed, but the subcutaneous nodules remained, and two fresh ones formed. The patient was treated as tuberculous, and his general condition improved. When first seen by **Burnier** eighteen months later (*i.e.*, in March, 1909) there were still ulcers on the back of the left index finger and on the back of the left hand, five nodules, about the size of peas, freely moveable and painless, had developed on the left hand and arm, and there was a mass the size of a nut on the left forearm, apparently sub-aponeurotic but not adherent to the bone. In the left retro-auricular region, which had been incised, there was a reddish, slightly pigmented scar resting on very resisting tissue, and there was a similar condition over a nodule in the left sub-epitrochlear region.

Burnier, suspecting the presence of sporotrichosis, incised one of the nodules, and made cultures from the fluid obtained, and from fragments of the nodule, on agar and glycerinated potato. In a week the tubes, left at the

temperature of the laboratory, showed a growth of mycotic colonies mixed with colonies of staphylococcus aureus, from which pure sub-cultures of sporotrichum Beurmanni were obtained.

Examination of the blood showed eosinophilia, 6 per cent., and sporoagglutination was present in dilutions of 1 in 100. Under treatment with iodides, the patient made a rapid recovery and in a month was considered as cured, although the percentage of eosinophiles remained unaltered.

In spite of the fact that the diagnosis as to the ocular condition could only be retrospective and that the lesions disappeared under local treatment, Burnier considers that they were probably due to sporotrichosis and that the case is of interest to ophthalmologists.

The ætiology of sporotrichoses, in general, is still obscure, but it would seem that in some instances the infection takes place through the palpebral integuments or ocular mucous membrane and facts of much importance both for the ophthalmologist and the general surgeon may be learnt from a study of such cases with regard to the conditions under which the parasite, which is widely spread in nature and even on the surface of normal mucous membranes, can penetrate the epithelial barrier and proliferate in the tissues. One of the recorded cases (Case II *supra*) seems to show that penetration of the parasite is possible without solution of continuity of the epithelial surface.

From the materials at our disposal up to the present time, the following conclusions may be drawn:—

Primary infection of the conjunctiva by the sporotrichum produces clinically follicular lesions, accompanied by ill-defined yellow spots, with considerable discomfort and marked grandular enlargement, while primary infection of the eyelids seems to commence as an ulcerating folliculitis with thickening and redness of the ciliary border, and is also accompanied by glandular enlargement. The nature of the lesions in each case can easily be established by culture of the scrapings from the spots or ulcers on appropriate media, preferably ascites agar, if the tubes are kept at a temperature of between 20° and 37° C. In all the recorded cases the parasite isolated has been the sporotrichum Beurmanni. Iodide of potassium acts very efficaciously in both the ocular and the cutaneous lesions, but local treatment should not be neglected. R. J. COULTER.

(4) The pathogenic *rôle* of the sporotrix was discovered by Schenk in 1898, and the organism was found affecting man by Beurmann and Ramond in 1903. Not until 1907 was the first eye case of sporotrichosis described by Danlor and Blanc: the eyelids were affected secondarily. Finally, in 1908 Morax and Carlotti published the first case of primary palpebral sporotrichosis, and quite recently Morax, Fava, and Burnier have each reported a case where the parasite affected the conjunctiva.

With a view to diagnostic difficulties between syphilis, tuberculosis, and sporotrichosis, **Aurand** (Lyons) undertook an experimental investigation on rabbits by inoculation of a culture of sporotrix obtained from M. Bonnet. Five series of experiments were undertaken, thirty experiments altogether. Inoculations were made on (1) the conjunctiva, (2) the subconjunctival tissue, (3) the cornea, (4) the iris, and (5) the vitreous. The conclusions come to by Aurand are:—(1) No conclusion (2) In a minimum of fifteen days, yellowish subconjunctival gummata appeared. They are sluggish in course, usually spontaneously resorbable, which is contrary to what takes place in man. They may also form abscesses without inflammatory reaction, tendency to ulceration, or propagation; without causing glandular enlargement, and without affecting the general health. (3) Two corneal forms occur, the one ulcerative with a floor which is scaly, whitish, prominent, and reminiscent of

aspergillary keratitis; the other interstitial nodular, resembling tuberculosis of the cornea, but developing more slowly (24 days as against 10 days). In contradistinction to this latter disease, it has little tendency to extend, and may undergo cure spontaneously in forty days instead of seventy-five. (4) The inoculation of a culture of sporotrichosis into the anterior chamber of the rabbit causes in five days a solitary nodule or gumma of the iris, of yellowish colour and resembling a tubercle rather than a condyloma. This nodule, however, appears much more rapidly than tubercle of the iris, does not tend to break down or to extend in the eye, and may undergo cure spontaneously at the end of seven weeks. Nevertheless, the lesion seems capable of reacting on the general health. In one experiment an old culture was used for injection into the anterior chamber. In this case a purely inflammatory and non-specific irido-cyclitis was produced. (5) When injected into the vitreous of the rabbit, the sporotrix, after the third day, rapidly caused in the vitreous and in the retina and choroid little round or oval disseminated foci of snowy whiteness and without any pigment ring, really forming in this way a miliary sporotrichosis of retina and choroid, just like experimental miliary tuberculosis of the choroid, but reaching its height and retrogressing to a cure much more rapidly. As a matter of fact, spontaneous cure may come about in fifty days, leaving *plaques* of cicatricial chorio-retinitis with circinate unpigmented borders, whereas experimental miliary tuberculosis of the choroid in the rabbit only cures spontaneously at the end of six months.

Experimental sporotrichosis of retina and choroid may show ophthalmoscopically large *plaques*, which give it a great resemblance to aspergillary pseudo-tuberculosis of the choroid.

Although, from its more rapid tendency to spontaneous cure this experimental sporotrichosis of the fundus may appear more benign than experimental tuberculosis, yet it is a severe affection, owing to the œdematous optic neuritis which is caused during the third week.

Aurand's paper is accompanied by two coloured plates showing subconjunctival abscess, gummatous swelling of the iris, and the chorio-retinitic lesions referred to.

The reader will find in THE OPHTHALMOSCOPE for 1908, p. 542, an abstract of Rollet and Aurand's paper in the *Révue Générale d'Ophtalmologie*, 1907, in which the authors compare experimentally tuberculosis and aspergillary pseudo-tuberculosis of the choroid. ERNEST THOMSON.

IV. ABNORMALITIES OF OCULAR MOVEMENTS.

Jackson, J. Hughlings, and Paton, Leslie.—On some abnormalities of ocular movements with particular reference to erroneous projection in cases of paralysis of muscles of the eyeball, especially cases of paralysis of an external rectus. Outgoing (centro-peripheral) v. Ingoing (Periphero-central) currents. *Lancet*, March 27th, 1909.

The problem, which the writers of this paper wish to throw some light on, is whether the erroneous projection which is found when an ocular muscle is paralysed is central in its origin and produced by the initiation in the upper brain centres of impulses greater than normal, which are partially or completely blocked on their way to the affected muscle or muscles, or whether it be peripheral, and due to impulses passing up to the brain from the

non-paralysed muscles of the unaffected eye, or possibly to disturbance of the afferent impulses from the muscles of the affected eye. This problem in itself forms only part of the much greater problem of muscle sense and of the sense of effort, and consequently is only a step towards the solution of the problem of whether every motor impulse is directly represented sensorially or only indirectly from the periphery.

The old teaching of Helmholtz, Bain, and Wundt, and of most ophthalmic surgeons, is that the erroneous projection is due to the development of a higher degree of the outgoing current. This, owing to a blockage on the efferent path, does not produce its full effect on the eye muscles paralysed, but it is fully represented centrally, with the result that the patient asked to point at an object makes the appropriate movements with his finger as if the eye had responded to the full impulse initiated.

Most modern psychologists reject this theory. Titchener in "An Outline of Psychology," states that "there is no such thing as a motor cell sensation, a sensation corresponding to the innervation of a muscle or group of muscles." And to explain the difficult problem of erroneous projection, Professor Müller suggested that the false projection was due to muscle impulses coming up from the unaffected eye, which, as Helmholtz has shown, has a direct influence, even when closed, in determining the position of an object looked at by the open eye.

The authors in attempting to solve the problem tried many experiments with prisms, but the results obtained in that way were unsatisfactory and it was resolved to wait for a case in which the external rectus of one eye was paralysed with complete third nerve paralysis in the other eye. In such a case there could be no possibility of the one eye initiating the muscle impulses which would give rise to false projection in the direction of action of the paralysed muscle of the other eye, since it could have no power of movement in that direction. Such a case was at length found and seemed to show that erroneous projection in cases of ocular palsy could not be due to muscle impulses coming up from the muscles of either eye. In conclusion, so far as the paper goes, it seems to favour the existence of direct central representation of motor impulses. LESLIE PATON.

V.—EXPERIMENTAL CHANGES IN THE RETINA.

Schreiber, L. and Wengler, F. (Heidelberg). – On experimental changes in the retina. (Ueber experimentelle Netzhaut-Veränderungen.) *Bericht der Ophthal. Gesellschaft*, Heidelberg, 1908. Volume published 1909, p. 159.

The authors injected electrolytically precipitated iron into the anterior chamber of rabbits, and by blocking the filtration angle, produced an artificial hydrophthalmus.

The first experiment lasted 61 days. The introcular pressure rose in the first six weeks gradually to 40 mm. Hg —that is to say, an excess of tension over the normal of 35 mm. Hg. was attained. The retina showed a stretching of about 21 per cent. and a concurrent thinning of 6 per cent. It remained, however, absolutely normal. Two quite unknown properties of the rabbits' retina were thus discovered, viz., a great tolerance to gradual hypertony, and a considerable ability to stretch.

But if pressure rose rapidly, a different condition came about. An early degeneration of the ganglion cells and of the nerve fibres set in, which could be traced by Marchi's method up into the optic tract.

It was demonstrated that stretching of the retina afforded a relative protection against degeneration.

Dogs eyes reacted in a different way. No hydrophthalmus appeared, but secondary glaucoma developed, in consequence of adhesions at the iridic angle with disappearance of the anterior chamber.

The enlargement of the dog's eye is rapidly followed by detachment of the retina. Examination of the chiasma by Marchi's method showed advanced degeneration of the respective optic nerve, and its tracts on both sides, crossed and uncrossed.

The authors then injected scarlet oil (solution of scarlet R. in olive oil). This acted similarly to the iron in blocking the angle, but had in this respect no advantage over the latter. It, however, had other effects. Extensive karyokinesis appeared in the corneal epithelium, with the production of an enormous number of giant cells. The vitreous showed hypertrophy of its supporting tissue, and probably a formation of fibrillæ. There was extensive production of albumin and fibrin, which eventually could produce detachment. Similar appearances are found in detachments in man. In the retina, which, like the vitreous, showed no sign of inflammation, were wide-spread degenerative processes and active cell proliferation. Ultimately, a condition entirely analogous to human retinitis pigmentosa was present. Some of the ganglion cells were displaced in the outer layers of the retina, there was an active locomotion of the ganglion cells. Some of them were enormously hypertophied, attaining the gigantic size of 60-70 μ, or double their normal size. Many showed the different phases of mitosis up to the final fusion into two cells. Some of them possessed a process which extended into the nerve fibre layer of the retina. There were changes in the outer granule layer, the normal neuroglia cells being bent. T. HARRISON BUTLER.

VI.—HEREDITARY OPTIC ATROPHY.

Raymond and Kœnig, Ed.—Hereditary atrophy of the papilla. (Atrophie héréditaire de la papille.) *Recueil d'Ophtalmologie*, mars, 1909.

Raymond and **Kœnig** discuss the symptoms, course, diagnosis, pathogenesis, and medico-legal aspects of this curious hereditary nervous disease which affects the maculopapillar bundle of the optic nerve, and record two fresh observations of their own. The symptomatology described follows the classical description given by Leber—*i.e.*, failure of sight coming on at or about the age of puberty preceded or followed by pain in the head ; slightly dilated pupils, which react normally. The diminution of vision is due to an absolute or relative central scotoma for white and colours. The peripheral field of vision is not generally affected, but there is often dyschromatopsia for green. They distinguish three stages in the ophthalmoscopic changes, which are confined to the papilla, *viz.*,—1. stage of hyperæmia, 2. stage of ischæmia, and 3. stage of pearly whiteness with excavation of the disc. They draw attention to the striking contrast between the marked depreciation of sight and the insignificant ophthalmoscopic changes in the early stages. They also note that these patients are liable to periods of amelioration and remissions, and that the sight is better in feeble than in strong light (nyctalopia).

In the matter of diagnosis they insist on the importance of age of the patient and suddenness of the failure of sight. These cases are liable to be mistaken for tabetic atrophy of the optic nerve, retrobulbar neuritis, toxic amblyopia, disseminated sclerosis with optic atrophy, and glaucomatous atrophy, but the history and the well-recognized signs and symptoms of each disease should prevent any mistake in diagnosis. The pathogenesis and ætiology of this disease are obscure. The pathological lesion has been ascribed to traumatism, as a violent blow on the head in those who are predisposed by heredity. This view is interesting, and has a medico-legal import. Daussat ascribes it to a localized periostitis in the neighbourhood of the optic foramen, arising out of circulatory troubles, and markedly influencing the central fibres (of the optic nerves) already affected by the premature senility. It is difficult to conceive that such a lesion should give rise to a sudden loss of vision at the same period of life with such remarkable regularity of onset and course.

Kersmaker also finds that persons suffering from toxic central amblyopia show signs of some innate debility or precocious senility. The writers are of opinion that some premature physiological senility is necessary to allow of the supervention of autointoxication or intoxication. The macular bundle is more liable to these morbid influences, because it is the last to attain its full development.

Kœnig and Ricklin have ascribed the lesion to an error of development of the sphenoid. According to Tillau, the sphenoidal sinuses do not attain their full development until twenty or thirty years of age. A malformation of the optic canal might be of hereditary origin, and result in constriction of the optic nerve, the macular bundle of which would be chiefly affected, owing to its position on the external part of the nerve on the temporal side at the optic foramen.

It is important to keep in mind the medico-legal aspect of hereditary papillary atrophy. In one case reported by the authors failure of vision followed a slight injury—foreign body in the cornea—which might have been ascribed as a cause of the blindness were it not that the left eye was affected some little time before the right.

Hanke described a case of hereditary atrophy, which was diagnosed as retrobulbar neuritis, arising out of exposure of the workman to sudden variations of temperature at work. In this case 60 per cent of the wages were allowed as compensation for total loss of earning ability. The development of the same disease in a brother proved the true nature of the case.

The clinical cases described by the authors presented no exceptional signs or symptoms. In all cases transmission was through the females who were unaffected. Direct transmission from affected mother to sons has been noted by Sym, Despagnet, and others.

There was no consanguinity in the authors' cases. Syphilis could also be excluded, but tuberculosis was noted in several members of the families; although no ætiological significance was attached to this. The prognosis in hereditary papillary atrophy is not as unfavourable as in other forms of optic atrophy. As a rule, the vision remains stationary after the primary and comparatively sudden failure, which naturally varies in degree in different cases, and does not always prevent the patient from following his occupation. Perception of light is retained in all cases. J. JAMESON EVANS.

VII.—TRAUMATIC RELAPSING KERATALGIA.

Cauvin, C.—On traumatic relapsing neuralgia of the cornea. (**De la névralgie cornéenne traumatique récidivante.**) *Archives d'Ophtalmologie*, mars, 1909.

Cauvin, of Nice, reviews that relatively rare affection, traumatic relapsing keratalgia. The condition was first described in 1872 by Hansen, and amongst British writers, it has received attention from Hulke and Bronner respectively.

The starting-point of this essentially local affection is always an injury to the eye, usually of a more or less trivial nature. That women appear to be more subject than men is probably due to the fact that they are more exposed to injuries from the nails of babies, a common accident. According to Cauvin, the nervous constitution and *arthritisme* predispose to the development of keratalgia. *Symptomatology.*—The sequence of events is—a slight injury to the cornea—a superficial lesion of the cornea—pain in the cornea disappearing after several days—recurrences of local pain after several weeks or several months of apparent cure. The corneal lesion may show itself as: 1. a tiny vesicle, filled with semi-transparent liquid, or 2. a simple corneal erosion, often so insignificant as to call for the use of methylene blue in order to show it up. In either case the epithelium is regenerated in the course of a few hours. Pain is not in direct relationship with the size of the corneal lesion nor with the regeneration of the epithelium, since it may persist after the epithelium appears to have become normal. The painful crises, with periods of freedom, rarely last for longer than eight to ten days. It must be very rare for them to last, as in Bronner's case, for eight months. The patient may then remain free from pain for several weeks or months, but suddenly, as a rule, on awaking in the morning, he has difficulty in opening the eye, the lids of which feel heavy. When the lids are opened, the patient experiences a sensation like that occasioned by a sharp foreign body in the eye, accompanied by lacrymation. No appreciable lesion of the cornea can be seen, and the eye, as a rule, looks normal. The pain disappears at longest in a quarter of an hour. The cycle of events described above may repeat itself almost indefinitely. *Prognosis.*—In general, prognosis is good. But Szili saw the epithelial lesion persist for a couple of months, and transitory hypopyon has been reported by Hansen. There may be a certain amount of iritis. *Diagnosis.*—Keratalgia must be distinguished from herpes zoster, herpes febrilis, neuralgic herpes of the cornea, and bullous or vesicular keratitis. *Pathogeny.*—The painful crises have been put down to lesions of the nerve-terminations in the cornea (Hansen), to inflammation of the nerves (Grandclément, Schroeder, and Prouff), to imperfect regeneration of the epithelium originally wounded (Szili), to astigmatism and spasmodic contractions of the ciliary muscle (Martin), or to local œdema of nervous origin (Peters). Cauvin himself suggests that keratalgia results from a neuritis of some of the nerve-terminals of the cornea, which is under the influence of a trophic alteration dependent on a nervous or arthritic diathesis determined by injury. *Treatment.*—During the acute crisis, aspirin, phenacetin, pyramidon, or quinine may be administered with a view to relieving pain. Nocturnal exacerbations may be met by potassium bromide, chloral, veronal, etc. Locally, hot compresses of mercury cyanide (0.20 per cent.) or iodoform or orthoform ointment are useful. Atropine may be employed from the onset of the attack. Hansen has insisted upon the sedative effect of that remedy. Cocaine, 4 per cent., may be used, and it is good practice to bandage the

affected eye. Acoine, 1 per cent., in oil, as recommended by von Pflugk, of Dresden, is an efficient local analgesic. Cauvin speaks well of anæsthesine, administered in cachets of 0·30 to 0·50 centigrammes, twice or thrice a day, and applied locally as 1 per cent. ointment. He has also used with success circumorbital inunctions with dionine ointment, 10 per cent. The subconjunctival injection of sterilized air was tried once by the author without conspicuous success. Other methods of treatment include excision of the cicatrix (Bronner), massage of the eyelids (Coppez), and cauterization with silver nitrate, 1 per cent. to 2 per cent., or with the galvano-cautery (Schroeder). SYDNEY STEPHENSON.

VIII.—INTRACAPSULAR EXTRACTION OF CATARACT.

Intracapsular Extraction of Cataract at the Bombay Medical Congress

A summary of the proceedings of the Congress has been published as a supplement to the *Indian Medical Gazette*, of March, 1909. The ophthalmic work done is described as "an apotheosis of Jullundur Smith." Several papers were read on the "Jullundur Operation," three of them being by Smith's pupils. Smith himself was present, and joined in the debate. "The discussion was animated if one-sided." **Drs. Wanless**, **Neve,** and **Rutter-Williamson**, declared, with reservations, for the Jullundur operation, while **Major P. P. Kilkelly**, who occupies the Chair of Ophthalmology in Bombay now, held an open mind in the question. He had tried the operation in over 500 cases, and was not satisfied that better results could be got by it than with other methods. Many speakers "were evidently influenced by the overpowering strength of the Jullundur party, and there was too much talk of the 'old school' and the 'new school.'" **Smith,** himself, is said to have remarked that the *rawal*, or coucher, had been ousted from Punjab by the brilliance of the ophthalmic surgery there, whereas elsewhere, "in the benighted parts," fewer operations were done in the public hospitals, because the coucher was still well able to hold his own as regards results.

The following abstracts are from proofs kindly supplied by Lieut.-Colonel Jennings, Secretary of the Congress:—

McKechnie, Capt. W. E.—Some Notes and Observations on the Operation of the Extraction of Cataract in the Lenticular Capsule.

This paper is based on three years' experience at Smith's Hospital at Jullundur. Interesting details of the daily routine are given. The cases are operated upon as soon as they come to the hospital in the morning There is no preliminary treatment, and no selection of cases. The great majority of them are not dressed again till the eighth day, the day of their discharge. If both eyes are cataractous, both are operated upon at the same sitting. McKechnie relates:—"When, three years ago, I first saw Smith operate I realized that I had not known how to do the operation. I watched Smith operate for a long time and studied his methods as closely as I could, but when I went back to my own hospital and tried to do the operation I found, somewhat to my disappointment and astonishment, that I was not much better at it than before. Then Smith began to teach me by allowing me to operate under his direction. It is the only way to learn. The

assistant is almost as important as the operator. His chief duty is the holding of the eyelid retractor. It is not so simple as it looks, and it took me several weeks of daily practice at operations before I became really good at it." He has now done over 500 extractions in the capsule. In one of the early cases both eyes were operated upon and both were lost by suppuration. In another case the lens was lost in the vitreous. There was no "serious escape of vitreous"; the percentage of escape was about 6 per cent. The only drawback noted from this complication was rather frequent impaction of iris in the wound. With the above exceptions, his results have been good.

Jamison, R. (Belfast).—**Extraction of Cataract in the Capsule.**

Jamison gives his experience at Jullundur as an absolute beginner. He performed 260 intracapsular extractions. There was loss of vitreous in 5·1 per cent. of cases, capsule left behind in 3 per cent., iritis in 1·5 per cent., suppuration in 0·8 per cent., expulsive hæmorrhage in 0·4 per cent., poor vision (below $\frac{6}{60}$) in 4·2 per cent. of cases. The first hundred cases were more or less selected; in some of them he failed to deliver the lens without using unjustifiable force, and gave up the attempt. In the later cases, although they were unselected, the results, on the whole, were slightly better.

Relative immunity from sepsis is attributed to: (1) the small number of instruments introduced into the eye, and (2) the powerful douche of perchloride lotion, 1 in 2,000, used before operation from a reservoir four feet above the patient's head. Prolapse of iris undoubtedly occurs somewhat more frequently than it does in the ordinary operation.

A detailed description is given of some of the special features of the Jullundur operation. The upper lid is drawn straight forward, or forward and slightly downward, by a blunt hook, like a large strabismus hook. This is held between the thumb and first two fingers of the right hand, "at such a length that the tips of the ring and middle fingers, fully extended, can push the peripheral fibres of the orbicularis upwards on the forehead and keep them there by pressing firmly on the upper margin of the orbit. This, in addition to preventing the orbicularis from pressing upon the globe, gives a good view of the upper fornix, and thus exposes the field of operation."

The methods adopted in the expression of the lens vary with the nature of cataract. Three varieties are distinguished. Contrary to common opinion, immature cataracts are the easiest to deal with, and over-ripe shrunken lenses the most difficult. The former are the only lenses which are expelled preferably without being turned over within the eye, in such a way that the lower margin is expelled first. Pressure is applied over the lower third of the cornea with a spatula held in the left hand, and with the end of a blunt hook held in the right hand. The pressure is directly backwards until the lens is about half delivered. "The spatula does not move, but the point of the hook may be drawn two or three times slowly across the cornea until the lens appears in the wound and is about half delivered. Then the pressure of the hook is slackened and its direction gradually changed, from backward to upward, so as to fold the corneal flap under the lens until the latter topples over into the cornea."

Next in order of difficulty come the swollen lenses with either soft or fluid cortex (Morgagnian). The stretched capsule is very liable to rupture. On this account it is important to rupture the zonule first below, in order that the capsule, in case it also gives way, shall not be drawn back into the globe. In these cases the spatula and hook are applied as above, but the pressure is more downward than backward. "Keeping up just enough pressure to

prevent the hook slipping, pull as if trying to make the patient look down." Thus, the zonule gives way below, and the lower border of the lens comes forward and finally upward. This pull is kept up until the lower border of the lens presents at the wound. The direction of pressure is then gradually changed, first backward, then upward. The capsule frequently bursts when the lens is half delivered, but it remains between the lips of the wound, and can be easily seized with a pair of dissecting forceps. Proficiency in this method of expression is much more difficult to acquire than in the preceding, but once acquired it removes what has been the chief reproach of intracapsular extraction.

The hypermature shrunken lens is the most difficult to extract, for, though strong as regards its capsule, it is also strong in its attachment. The method adopted is as with the swollen lenses, but the attempt to tear the suspensory ligament below often fails, and vitreous appears in the wound, necessitating the introduction of an instrument (the spatula) to support the lens.

The patient is allowed to look in any direction he pleases during the operation, and usually turns his eyes upwards. The Jullundur experience is that loss of vitreous is least frequent with the eyes in this position.

Lister, Captain A. E. J.—Extraction of Cataract in the Capsule.

Lister gives the results of 576 intracapsular operations performed by himself, mostly at Jullundur. Two eyes were lost by suppuration, but there was no case of iritis. There was escape of vitreous in 5·03 per cent. of cases. Excluding lenses previously dislocated by native couchers, the percentage of this accident sinks to 4·7. The only ill result seen from it was one case of drawing up of the iris, leading to occlusion of the pupil. In one case considerable flattening of the cornea followed, but it was temporary, and disappeared in six weeks. From an examination of certainly not less than 250 eyes seen at various periods after discharge from hospital, it is concluded that the average vision obtained by this operation in healthy eyes is $\frac{6}{6}$. The resulting astigmatism is usually from 0·75 D. to 1 D. The iris is rather liable to prolapse after this operation.

Lister, Capt. A. E. J.—The After-Effects of Escape of Vitreous.

This paper is based on the examination of 98 eyes in which vitreous had been lost during intracapsular extraction. The period which had elapsed since the operation ranged from six months to nine years, and averaged 5·7 years. In eight of the eyes a portion or the whole of the lens capsule had been left behind. There appears to have been no clear evidence that any one eye in the series had suffered from the vitreous accident.

It is to be regretted that no information is given regarding the conditions of the enquiry, beyond the statement that these were the patients who presented themselves for examination in response to written invitations addressed to all the available cases of vitreous accident taken from the hospital records. The reviewer was informed some time ago of this inquiry, which was being made with the main object of ascertaining the proportion of cases in which loss of vitreous at the operation led to loss of vision later. So far as the information went, the inquiry was foredoomed to failure, and, indeed, proved absolutely valueless as regards this main point. For some inducement had to be offered to the patients to bring them back to Jullundur. The reviewer understands that the patients were presented with spectacles. If this was the

case, the omission to note the fact in this report is misleading. What inducement was offered to possible patients with blind eyes to return for examination? Under any circumstances it is recognised as very difficult to get one's operative failures back again. And this applies particularly in India.

It is, however, interesting to know that the average vision in the eyes examined was very high indeed where there was no corneal opacity, capsule left behind, or fundus disease. The visual acuteness is given of 61 such eyes with the aid of spherical lenses only. In four it was $\frac{6}{3}$, in six $_{3\cdot5}\frac{6}{}$, in four $\frac{6}{4}$, in five $_{4\cdot5}\frac{6}{}$, in four $\frac{6}{5}$, in thirty-three $\frac{6}{6}$, in two $\frac{6}{8}$, in three $\frac{6}{9}$. This extraordinarily good result is said to be partly explained by the strong light and clear atmosphere under which the tests were carried out. But there were also accountable the clear pupils and low degree of astigmatism in the eyes. The latter was scarcely ever over 1 D.

So far as the figures go, the amount of vitreous lost does not appear to have any decided influence on the result. Lister remarks that eyes from which a large amount of vitreous has been lost often have poor vision at the time of discharge from hospital. But this defect appears to be merely temporary. It is suggested, in conclusion, that vitreous escape complicating intracapsular extraction of the lens may be less serious than in the ordinary operation, where capsule and cortex are left behind. The eight eyes of the series in which lens capsule was found had not suffered in any way, but it is remarked that in only one of the eight cases was the amount of capsule remaining large.

Oxley, Captain J. C. S.—The Complete Removal of Cataract.

The results of a series of 378 intracapsular operations are given. There was loss of vitreous in 27·3 per cent. of the cases. This is somewhat better than in two smaller series reported earlier by this surgeon (See THE OPHTHALMOSCOPE . . . .) The high percentage is attributed to defective *technique*, due to the fact that Captain Oxley had not seen Smith operate later than the year 1904. In 5·5 per cent. of cases there was the double accident, escape of vitreous with rupture of capsule. One hundred of the cases had been followed up for periods varying from three months to over three years. There were three suppurations, and six closed pupils from iritis. These infections may be explained by the fact that boric lotion was used for flushing out the conjunctival sac before operation, instead of perchloride as at Jullundur. There was one loss of vision from detachment of the retina, which occurred while the patient was in hospital. There had been no accident at the operation, but presumably vitreous had escaped later, for the pupil became characteristically deformed and drawn up. In two cases deterioration of vision occurred after the patients had left hospital from similar drawing up of the pupil. In another case later deterioration of vision was attributed to dust-like opacities in the vitreous; the operation had been uncomplicated.

Gidney, Captain H.—Extraction of Cataract in the Capsule.

This is a long paper discussing the *pros* and *cons* of the operation, with a strong bias in its favour. Gidney reports 811 of these extractions, with loss of vitreous in 10·5 per cent. of the cases.

Matra Das (Hospital Assistant).—Extraction of Cataract in the Capsule.

This Hospital Assistant reports that he has extracted 1,653 cataracts in their capsules, having learnt the method at Jullundur. The results are given of the last 162 operations only. There were only four failures, two from

expulsive hæmorrhage, one possibly from detached retina in a case in which the lens was lost in the vitreous, and one from haziness of the cornea. By the ordinary operation in early days he only had 86 per cent. of good results.

H. HERBERT.

IX.—CATARACT OPERATIONS.

(1) **Skeel, Frank D., New York City, U.S.A.—Notes on Cataract Operation.** *American Medicine*, November, 1907.

(2) **Fox, L. Webster.—The delivery of the lens for the extraction of cataract; irrigation of the anterior chamber and the first toilet of the wound.** *Journal of the American Medical Association*, 1907.

(3) **Truc.—An exceptional case of couching of a cataract with preparatory iridectomy.** (Un cas exceptionnel d'abaissement de la cataracte avec iridectomie preparatoire.) *Ann. d'Oculistique*, T. CXXXIX, p. 350, mai, 1908.

(4) **Rollet.—On extraction of the lens with a hook resembling a fish hook.** (De l'extraction du cristallin au crochet-hameçon.) *L'Ophtalmologie Provinciale*, T. V, p. 149, octobre, 1908.

(5) **Rohmer.—On cataract operations on diabetic patients** (De l'opération de la cataracte chez les diabétiques.) *L'Opthalmologie Provinciale*, T.V, p. 181, décembre, 1908.

(6) **Post, M. H.—Report of needling a cataract in a patient thirty-five and another thirty-seven years of age.** *American Journal of Ophthalmology*, February, 1909.

(7) **Howe, Lucien.—Improvements in the technique of the extraction of cataract.** *New York State Journal of Medicine*, March, 1909.

(8) **Tooke, F. T.—Capsule forceps in cataract extraction.** *Montreal Medical Journal*, May, 1909.

(9) **Parsons, J. Herbert.—On methods of cataract extraction: A critical review of the methods at present advocated.** *Lancet*, 17th July, 1909.

(2) **Fox** (Philadelphia) writes a chatty sort of article on some points which have attracted the attention of ophthalmic surgeons from Daviel onwards. The writer seems to have made a special hobby of cystitomes, of which he figures "almost every variety in use from Freytag, down to the latest model of to-day." Delivery of the lens within its capsule, flushing of the anterior chamber, and the preparation of instruments are among other subjects discussed. Fox has given up sterilization of instruments by boiling, because it destroys them. For ten years he has cleansed his instruments by immersing them for five minutes in 1 to 3 alcohol and distilled water and then carefully drying them with sterilized gauze. ERNEST THOMSON.

(3) **Truc's** patient, a man, aged 70, had in his right eye cataract, chorioretinitis, and iridodonesis, granular ophthalmia, with trichiasis and purulent dacryocystitis. His left eyeball was atrophied. After curing the trichiasis by

operation and treating the dacryocystitis and conjunctivitis by the usual methods, Truc did a downward iridectomy with a conjunctival flap as a precaution against glaucoma, and subsequently couched the lens, cauterising the seat of puncture before inserting the needle and after withdrawing it. He considers that extraction of the lens would almost certainly have been followed by suppuration, whereas after the couching, the patient had enough sight to go about alone and to do some work. R. J. COULTER.

(4) **Rollet** (Lyons) prefers a hook with points like tiny fish hooks to the curette or vectis for use in cataract operations when the lens is subluxated or does not come away in spite of pressure applied in the usual manner, and in extracting Morgagnian cataracts. He also uses the instrument for removing dislocated lenses. As a rule, the hook should be inserted in the posterior surface of the lens, but in cases in which the lens is held by adhesions, it may be seized by its upper border. R. J. COULTER.

(6) The various authors give different ages beyond which needling an intact lens is not advisable. These ages vary from fifteen to thirty-five. **Post** has had two cases between thirty and forty years. In the first case needling was done at age thirty-five, presumably on account of an unhealthy condition of vitreous. Thirty hours later linear extraction had to be performed on account of swelling of the lens and pain. Recovery was uneventful, corrected vision six weeks later was $\frac{20}{30}$. Twelve years later it was $\frac{20}{24}$. In the second case at 37 years of age, although there was considerable pain and nausea after the needling, linear extraction was avoided. Recovery was slow and attended by iritis. Nine months later corrected vision was $\frac{20}{75}$; wrinkled membrane in pupil which remains to be dealt with. So far as the reviewer can make out, no urgent reason is stated for preferring a needle operation in this case. Post also reports an interesting case related to him by John Green. The patient was a myopic deaf-mute with only one seeing eye. In this eye, which became cataractous, it was known that the vitreous was extensively liquefied; the patient was extremely nervous and could only be communicated with through the sense of touch. Although the patient was forty-one years old, one must admit that her condition was unfavourable for ordinary extraction. The cataract was needled four times. Eleven years after the final needling, vision with +9D. $=\frac{15}{38}$, and with +13D. she read her magazine fluently. At no time was there any iritis or other complication.

These cases reported by Post give one food for reflection.

ERNEST THOMSON.

(7) **Howe** (Buffalo) describes a pair of fixation forceps which take a grip on the tendon of the internal or of the external rectus, and also a pair of specially curved (modification) forceps with which to assist the delivery of a lens stuck in a too small an incision. ERNEST THOMSON.

(8) **Tooke** (Montreal) makes an appeal to all interested in ophthalmic surgery, more particulary to those who, either from ultra-conservatism or from inexperience with capsule forceps, have adhered to the older method of employing the cystitome. The ordinary *technique* is then described and the advantages gained by using the capsule forceps are given as follows.—One pair of forceps is suitable for either eye, not requiring to be bent or twisted into various shapes, as is so frequently necessary in the case of the cystitome. Frequent sharpening of the instrument is not necessary, a precaution which must often be attended to in the case of the cystitome. After the torn capsule has been removed, no post-operative cataract in capsule shreds remain about the pupillary area requiring subsequent discission. He believes the capsule forceps mainly responsible for more ready tendency to healing by first intention. Shreds of capsule by the cystitome method find their way

between the lips of the wound, and primary union is not only occasionally delayed, but actually prevented. With the capsule remains removed, primary healing is almost positively assured. Photographs of sections are shown demonstrating the above points. The article concludes with a description of a pair of capsule forceps, designed by himself, which he has found most useful. HANFORD MCKEE.

(9) **Parsons** (London) reviews the relative advantages and disadvantages of the several methods of removing cataract in common use. Dealing with the "combined" extraction, he advocates the making of a small peripheral iridectomy, after the lens has been removed, as in the "simple" operation. The periphery of the iris under these circumstances is drawn out of the wound, and a small fold is cut away by de Wecker's scissors. The author is of opinion that the risks of using capsule forceps "may be, and often are, greater that the advantage attained." Their employment, moreover, calls for a higher degree of operative skill. Discussing "simple" extraction, Parsons lays stress upon the greater anxiety and necessity of unremitting attention entailed upon the surgeon (and nurse) by that procedure. Extraction in the capsule, in Parsons's opinion, "is unsuited for the routine treatment of senile cataract." It still retains its place for certain complicated conditions, the nature of which he does not specify. He contrasts the 6 per cent. to 7 per cent. of cases with loss of vitreous, reported from the practice of Major Henry Smith, I.M.S., with the figures of some other Indian surgeons—as 30 per cent. to 40 per cent. (Oxley), 37 per cent. to 47 per. cent. (Birdwood), and 38 per cent. (Maynard). He concludes that "this extreme divergence must be due to some grave fallacy which must be discovered before the operation can be recommended for general use." The reviewer may venture to suggest that individual skill and the self-control of natives in various parts of India may go some way towards explaining the discrepancy of the figures. SYDNEY STEPHENSON.

X.—COMPLICATIONS AND AFTER-TREATMENT OF CATARACT EXTRACTION.

(1) **Fuchs—Depression of the posterior pole of the eye following cataract extraction.** (De ressione del polo oculare posteriore in seguito ad estrazione della cataratta.) *La Clinica Oculistica*, May, 1907.

(2) **Lopez.—Unrestricted movements by patients after cataract extraction.** (La mobilisation chez les opérés de cataracte.) *Recueil d'Ophtalmologie*, décembre, 1907.

(3) **Hulen, Vard H.—Opacification of the cornea following cataract extraction.** *Journal of the American Medical Association*, 25th July, 1908.

(4) **Truc.—Accidental ocular traumatisms following cataract extractions.** (Traumatismes oculaires accidentels consécutifs à l'extraction de la cataracte.) *L'Ophtalmologie Provinciale*, T. V, p. 134, septembre 1908.

(5) **Peters, A.—On some complications during convalescence after cataract extraction.** (Ueber einige Storungen im Heilungsverlaufe der Star operation.) *Zeitschrift. für Augenheilkunde*, Oktober, 1908.

(6) **Bonsignorio, Doctoress.— Escape of vitreous during cataract extraction.** (De l'issue du corps vitré pendant l'extraction.) *La Clinique Ophtalmologique*, 10 décembre, 1908.

(7) **Trousseau, A.—The uræmia of old people after cataract operation: its treatment.** (L'urémie des vieillards après l'opération de la cataracte: son traitement.) *La Clinique Ophtalmologique*, 10 février, 1909.

(8) **Lawson, Arnold.—A clinical lecture on the after-treatment of an uncomplicated case of extraction of senile cataract.** *Lancet*, 29th May, 1909.

(9) **Bullar, J. F.—The after-treatment of cataract extraction.** *Lancet*, 12th June, 1909.

(1) Detachment of the choroid has comparatively recently been recognised as a not infrequent sequel of cataract extraction, and the signs of the accident are fairly well-known. Recently **Fuchs** has observed a case in which the classical appearances of detachment of choroid (disappearance on the second day of the already-formed anterior chamber) was associated with a totally different ophthalmoscopical condition. The patient was highly myopic; after cataract extraction the anterior chamber reformed on the morrow, but re-emptied on the following day. Fuchs diagnosed a detached choroid, but the ophthalmoscope showed an almost circular fold of the ocular coats protruding into the cavity of the globe, round the optic nerve. The course and deviations of the retinal vessels showed this to be a real fold. Two days later, the fold had disappeared only to be replaced by a typical detachment of the choroid. Fuchs supposes that the fold was due to the want of resistance of the softened sclera. HAROLD GRIMSDALE.

(2) **Lopez** maintains that it is unnecessary to confine to bed those patients who have been operated on for cataract, and that recovery is not impeded if the patients are allowed to walk about and to eat and to smoke in their ordinary ways. He gives an account of eighteen cases, which include several complicated cataracts and several extractions without iridectomy, where this plan was adopted with complete success. After the operation he applies an occlusive, but not compressive, gauze pad, fixed by strapping over the eye operated on, and the other eye is left uncovered. The patient is then allowed to go home, walking not being prohibited. Forty-eight hours later he returns for the first dressing. J. JAMESON EVANS.

(3) Based upon a study of this condition, **Hulen** (San Francisco) offers the following deductions: treatment is of but little or of no avail, and there is no indication known by which the complication can be determined beforehand. He states, however, that by reason of a personal warning received from such a result in an eye in which the cause was undetermined, he would favour some method other than extraction for the remaining cataract, suggesting that under such circumstances couching might become a justifiable procedure. CHARLES A. OLIVER.

(4) **Truc** (Montpellier) has found accidents during the course of healing of the cataract extractions 20 times in 2000 operations. They resulted either from pressure due to sudden contraction of the eyelids with congestion, *e.g.*, from coughing, retching, etc., or from contusions, and can be divided into three classes according as they cause (1) slight hyphæma with minimal and transitory visual troubles followed by rapid and complete recovery; (2) opening of the corneal wound with diffuse intra-ocular hæmorrhage, incarceration of

the iris at times, and more or less serious visual trouble followed by slow and often incomplete recovery; (3) extensive rupture of the corneal wound with prolapse of the iris and loss of vitrious or expulsive hæmorrhage, followed by infection or atrophy. The treatment should be medical, operative interference being postponed. For prophylaxis the usual precautions are recommended, and it is suggested that enquiries should be made for a history of epilepsy in all cases of cataract. R. J. COULTER.

(5) **Peters** (Rostock). —The complications noticed are: (1) Keratitis bullosa, caused by degeneration of the corneal endothelium, (2) Keratitis due to excessive alkalinity of a solution of oxycyanide of mercury, and (3) Headache after extraction. T. HARRISON BUTLER.

(6) This is a general article on the subject of operative *technique*, when escape of vitreous takes place at any period in the execution of the extraction. ERNEST THOMSON.

(7) **Trousseau** (Paris) contributes several case-histories, some of which have already been published, and others not, of post-operative intoxicative-uræmia. Although, for their age, such patients may be in perfect health, they may exhibit signs of mental disturbance. After operation, especially during the night time, the possibility of suppression of urine must be borne in mind. The accident is a serious one, and death may result, in spite of the most energetic treatment—cupping, purgatives, massage, and even bleeding. The cause of the defective kidney action as the result of operation is very difficult of explanation. ERNEST THOMSON.

(8) This lecture by **Lawson** (London) is divided into headings: (1) bandages and dressings, (2) local treatment, and (3) general treatment.

The author prefers to do his operation with the (private) patient in his own bed in order to avoid the necessity for moving. A double bandage is employed for the first two or three days, and the single bandage up to a week or ten days from the operation. After that the patient wears dark smoked glasses. After detailing the points in the operation which lead to quick healing, *viz.*, a clean large section in the limbus, a conjunctival flap, and a careful toilet of the iris, Lawson refers to the avoidance of iritis by the early use of atropin, and considers it wise to instil it before applying the dressing after operation. If the pupil is not well dilated the day after operation, 1 per cent. atropin is instilled three times that day, and if, on the second day, the pupil is contracted, 2 per cent. atropin is combined with 4 per cent. cocain, watching for toxæmia and reducing the dose as soon as dilatation occurs. As to the dressings, the maxim is to be, "Look on and watch; do not disturb." As much as possible leave the eye alone, except for atropinization, for the first two days.

The author then proceeds to speak of the control of the patient's hand on the operated side by hobbling it to the bed. The hand should have as much play as will allow it to reach the waist. Instead of the hobble, a light cardboard splint may be fastened over the flexor surface of the elbow.

As to the important matter of post-operative shock, Lawson considers that the patient should be kept very quiet and have no visitors for a day or two. The patient should be warned that he will have some pain. If the case is going to do well, the pain will probably have ceased in eight hours: it arises from the iris while the anterior chamber is unformed. It is an invariable rule in the author's practice to order a sedative the first night after the operation. This is given without hesitation if the patient cannot sleep or is at all restless, and generally consists in 20 grains of chloral hydrate and 20 grains of potassium bromide. Restlessness is often caused by the double bandage, and to give the patient confidence in his darkness, a night nurse

should be employed for the first two or three nights in private cases. In old people the pulse and temperature must be watched, since the aged are apt to have complications from lying on the back. The flatulence trouble is mentioned. "An important matter . . . . is the question of micturition and defecation. Should you insist on a patient who has had cataract extraction passing his motions and his water lying down? To that I emphatically answer 'No,' unless you find that the patient has no difficulty in doing so.' Purgatives are not given till the second evening after the operation. As to diet, the food for the first day or two should be minced or pounded, or fluid. After the second day, if all is well, the ordinary diet may be given. "There is, perhaps, a feeling among nurses that ophthalmic cases do not require much nursing . . . . Those best qualified to judge know that no class of patients requires more watching and care than intraocular operative cases, for in none does success depend more on attention to detail, and in none is the boundary line between success and failure more easily overstepped." ERNEST THOMSON.

(9) **Bullar** (Southampton) states, with reference to the foregoing lecture by Lawson, that for 15 years he has adopted a different method, which, he thinks, makes the patient more comfortable both in body and mind. The method consists in affixing a small piece of cotton wool on the operated eye by means of a piece of fine isinglass plaster, pulled just tight enough to exert a little pressure over the inner corner of the eye. Over the wool, but not pressing on it, is placed a conical shield of Willesden roofing paper, and this is fixed in position with short strips of isinglass plaster. The unoperated eye is never covered, nor are the hands tied. The patient is made to keep quiet in bed for 24 hours and is then generally allowed to get up and sit in a chair. Atropine and cocaine are applied at the first dressing. In the summer the patients are often out in the garden on the third or fourth day. A patient is never told to expect pain, but that if there should be pain he need not be alarmed. An empty anterior chamber is not necessarily a cause of pain. "To blindfold a patient, handcuff him, feed him on slops, tell him to lie still in bed and keep his mouth open if he moves, and to expect pain—all this seems to me the best way to ensure that he shall be nervous and have pain; and if to this suggested treatment is added a dose of chloral, this is surely enough to account for the night terrors and dementia Lawson describes without the shock of the little operation." ERNEST THOMSON.

XI.—CATARACT: MISCELLANEOUS POINTS.

(1) **Chevalier.—Zonular cataract: A clinique by Professor de Lapersonne.** (Cataracte Zonulaire: Clinique de M. le Pr. de Lapersonne.) *L'Ophtalmologie Provinciale*, T. III, p. 148, janvier, 1907.

(2) **Henderson, Thomson.—A histological study of the normal healing of wounds after cataract extraction.** *Ophthalmic Review*, May, 1907.

(3) **Calderaro.—A rare variety of Morganian cataract. Anatomical examination.** (Varieta rara di cataratta Morgagniana—cristalloide transparante contenente un liquido limpido come acqua—Esame anatomico.) *La Clinica Oculistica*, Marzo, 1908.

(4) **Armaignac.— The spontaneous absorption of the lens in the adult. (La resorption spontanée du cristillin chez l'adulte á la suite, des cataractes traumatiques ou provoquées par discission.)** *Recueil d'Ophtalmologie*, juillet, 1908.

(5) **Nettleship, E.—Lamellar cataract, "Coppock" or discoid cataract and retinitis pigmentosa, affecting different members of the same pedigree.** *Transactions of the Ophthalmological Society of U.K.*, Vol. XXVIII, 1907-8.

(6) **Nettleship E.—Senile cataract in husband and wife; condition o the lenses in their children and grandchildren.** *Transactions of the Ophthalmological Society of U.K.*, Vol. XXVIII, 1907-8.

(7) **Weekers, L.—Pathogenesis of anterior polar cataract.** *La Clinique Ophtalmologique*, 10 avril, 1909.

(2) This paper, by **Henderson**, of Nottingham, is based on the microscopic examination of 33 aphakic eyes. In 21 death intervened in a period of time between 3 days and a month after the operation of extraction. Four of the eyes were enucleated for pain and secondary glaucoma, while 8 specimens were obtained *post-mortem*. The different forms of incision practised for the operation are discussed, and then comes a detailed description of the healing of (1) a corneal incision, (2) a limbal incision. After this, the factors which are responsible for post-operative astigmatism are discussed. The cases are tabulated. There is a copious bibliography and the paper is illustrated with 6 photomicrographs.

C. DEVEREUX MARSHALL.

(3) **Calderaro** gives the history of a patient, who showed this rare form of cataract. His left eye had failed about eight years previously. He had suffered some pain for a few days. The anterior chamber was deep, and contained a transparent vesicle, at the bottom of which lay the small yellow lenticular nucleus. The Morgagnian cataract had been dislocated into the anterior chamber. The whole was extracted and immersed in a solution of sublimate, in which the endo-capsular fluid became opaque; in absolute alcohol the transparency was regained. The whole was embedded in celloidin and cut. The chief point to note was the entire absence of the epithelium which normally lines the anterior capsule. There is little doubt that this absence accounts for the transparency of the capsule. When the cortex of the lens becomes fluid, the anterior cells lining the capsule usually proliferate, and the capsule loses its transparency. There is no obvious reason to account for the unusual course of things in the present case. H. GRIMSDALE.

(4) Contrary to the usual practice, **Armaignac** has been in the habit of obtaining absorption of the lens by discission in patients of 25 to 40 years of age. No excessive local reaction or glaucomatous symptoms follow the needling, but considerable patience seems necessary on the part of operator and patient, as absorption of the lens matter is not complete for two or three months. Armaignac always uses a knife-needle for this operation (never Bowman's needles.) He makes a crucial incision, the vertical part of which is 5 or 6 mm. long and cuts deeply into the lens. The horizontal part is made as extensive as the pupil will allow. On a few occasions he has found it neeessary to repeat the operation after a few weeks, but has never been obliged to operate a third time. J. JAMESON EVANS.

(5) **Nettleship's** painstaking and elaborate examination of, and report upon, a pedigree of 275 persons cannot be advantageously summarized. It is, perhaps, advisable to state that "Coppock" cataract is the name given for

working purposes to a peculiar variety of stationary congenital opacites in the lens found in numerous members of a family of that name living near Oxford, and described by Nettleship and Ogilvie in *Transactions of the Ophthalmological Society*, Vol. XXVI, 1906, p. 191. Nettleship now suggests *discoid* as a provisional term for this condition of cataract. ERNEST THOMSON.

(6) **Nettleship's** article, with genealogical tree, does not lend itself to abstract. Seven out of ten children, and five out of twenty-six grandchildren presented lenticular opacities. ERNEST THOMSON.

(7) The object of **Weekers'** article is to emphasize the fact that while in most cases anterior polar cataract can be traced to a previous corneal ulceration—although not necessarily to a perforating ulcer—there are occasional cases in which previous post-natal corneal disease can be definitely excluded, and in which ante-natal corneal disease is rendered highly improbable by the absence of opacities. He reports such a case in an infant 10 days old, and describes it as undoubtedly congenital. He suggests as its cause an abnormal persistence of adhesion between lens and cornea, which had finally given away and left a circumscribed lenticular opacity. ERNEST THOMSON.

XII.—MAGNETS AND MAGNET OPERATIONS.

(1) **Marri, E. (Turin).—The giant electro-magnet in eye surgery.** *Annali di Ottalmologia*, Vol. XXXVI., fasc. 5, p. 319 to 352.

(2) **Hirschberg, J.—Remarks on magnet operations. (Bemerkungen zur Magnet-Operation.)** *Centralbl. f. prak. Augenheilkunde*, Februar, 1908.

(3) **Mellinger, Carl.—The ring magnet. (L'aimant à pôle interne.)** *Archives d'Ophtalmologie*, avril, 1909.

(2) **Hirschberg** (Berlin) reports a case of a successful magnet operation in a child of 10, in whom ten days after the operation the anterior chamber became filled with blood and there were also signs of hæmorrhage into the vitreous. This all cleared up, and the eye has remained normal since. In connection with this case Hirschberg classifies the hæmorrhages that occur in these cases into primary, secondary, and tertiary, not counting the hæmorrhage which may happen at the time of the accident. Primary hæmorrhage occurs during the operation. Secondary hæmorrhage, as in the case above cited, a short time after the accident, during the process of healing; and tertiary hæmorrhage is such as may occur after the healing process is complete, as the result of another injury which in a normal eye would not bring on bleeding. Examples of these different conditions are cited. A. LEVY.

(3) In the present communication **Mellinger**, of Basle, describes the *innenpol* magnet for the removal of foreign bodies from the eye devised by himself and Klingelfuss, an electrical engineer, also of Basle. As the appliance was discussed in the columns of THE OPHTHALMOSCOPE as recently as May last (p. 325) by T. Harrison Butler, no additional particulars as to construction and action now appear to be called for. At the same time it may serve a useful purpose to give the results achieved by Mellinger with the instrument. They are as follows.—36 cases of iron particles lodged in the eye are mentioned. Of that number, 5 were in the cornea, 2 in the sclera, 4 in the anterior chamber, 2 in the iris, 1 in the ciliary body, 9 in the crystalline, 6 in the vitreous, 5 in the retina, 1 in the retro-ocular tissues, and, finally, the site

of 1 was unknown. With the exception of the retro-ocular case and of a case where the piece of metal was entangled in the ciliary body, extraction with the ring magnet was always crowned with success. The weight of the foreign body was determined with exactitude in 32 cases. For the 7 bodies lodged in cornea or sclera, weight averaged 0 gr. 00073; for 6 foreign bodies lodged in iris or anterior chamber, 0 gr. 0117; and for 8 foreign bodies in the vitreous or retina, 0 gr. 104. SYDNEY STEPHENSON.

XIII.—TOXIC AMBLYOPIA.

(1) **Wood, Casey A.—Some recent cases of death and blindness from wood-alcohol poisoning.** *British Medical Journal*, 29th December, 1906.

(2) **Golescéano, C.—Toxic neuritis due to sulphide of carbon. (Névrite toxique due au sulfure de carbone.)** *La Clinique Ophtalmologique*, 25 août and 10 septembre, 1907.

(3) **Carhart, W. M.—Toxic amblyopia from wood-alcohol.** *American Medicine*, Vol. III, No. 4, April, 1908.

(4) **Erdmann, P.—Ocular changes produced by dimethyl sulphate. (Ueber Augenveränderungen durch Dimethyl sulphat.)** *Arch. f. Augenheilkunde*, Bd. LXII, Dezember, 1908, S. 178-227.

(1) **Casey Wood** (Chicago) states that not a single case of wood-alcohol (methyl alcohol) amblyopia has been published as occurring in Great Britain. Methyl-alcohol poisoning is, however, very common in the United States. Poisoning may occur by drinking the fluid or by inhalation of fumes in a confined atmosphere. The general symptoms are nausea, vomiting, abdominal distress, weakness of extremities, pallor of face, coldness of hands and feet, severe headache, and difficulty of breathing. Partial unconsciousness may deepen into coma, and be followed in twenty-four to forty-eight hours by convulsions and death. Sight may be partially or totally lost. Amblyopia may be an early or a late sign, and is due to optic neuritis in either case. In patients who recover there is, in a few days, a more or less complete return of vision, followed after some time by deterioration of sight, and, eventually, as a rule, by total permanent blindness, due to post-neuritic atrophy.

ERNEST THOMSON.

(2) **Golescéano** (Paris) gives a most elaborately detailed account of some cases of retrobulbar neuritis in men employed in the vulcanizing of rubber.

ERNEST THOMSON.

(3) The special interest of the case reported by **Carhart** (New York) is that the patient suffered a severe toxic amblyopia, and presented from the start a typical picture of neuro-retinitis, from the inhalation (only) of the fumes of wood alcohol. His symptoms began with vertigo and nausea, and failure of sight soon intervened, after working for three weeks "shellacing" the interior of beer vats. He remained blind for ten days when he began to have some vision, but the optic discs at the time of writing were becoming atrophic. "It is not so uncommon", says the author, "for wood alcohol to give such a picture if taken internally in bulk, but the extreme degree of damage to the patient in this instance was not complicated by any such cause." ERNEST THOMSON.

(4) **Erdmann** has carried out some experimental investigations into the effects produced by fumes of dimethyl sulphate. He finds that they cause severe inflammation, especially of the cornea, which is accompanied by lacrymation, œdema of the lids, hyperæmia and œdema of the palpebral and bulbar conjunctiva, extreme photophobia, and pain. The inflammatory changes reach their greatest intensity in the course of 24 hours, and culminate in a vesicular detachment of the corneal epithelium and haziness of the cornea. The latter is brought about by detachment of the endothelium and œdema of the ground substance, while the vesicles which appear on the anterior surface of the cornea are caused by fluid which collects between the ground substance and the nasal cells. Gradually, the œdema of the cornea disappears and the epithelium becomes regenerated, but a permanent haze of the cornea remains, which is due to a slight parenchymatous keratitis.

PERCIVAL J. HAY.

XIV.—REMEDIES.

(1) **Trebilcock, F. C. (Toronto)—Therapeusis in conjunctival inflammations.** *Canada Lancet*, January 1909.

(2) **Lundsgaard, K.—Light-treatment of conjunctival affections (tuberculosis conjunctivæ.)** [Lightbehandling von Konjunktivalleiden. (Tuberculosis conjunctivæ).] *Klin. Monatsbl. f. Augenheilkunde*, April, 1909.

(3) **Laas, R. E.—A very severe case of interstitial keratitis cured by tuberculin (T. R.).** (Ein durch Tuberculin (T. R) geheilten Fall schwerster parenchymatöser Keratitis.) *Klin. Monatsbl. f. Augenheilkunde*, April, 1909.

(4) **Angélis, Philippe.—Very early gumma of the ciliary body; intensive treatment by intravenous injections.** (Gomme très précoce du corps ciliaire; traitément intensif par injections intraveineuses.) *La Clinique Ophtalmologique*, 10 mai, 1909.

(5) **Beck, M.—Disturbances of vision in the course of treatment by Atoxyl.** (Uber Sehstörungen bei Schafkranken in Verlauf der Atoxylbehandlung.) *Centralb. f. prak. Augenheilkunde*, Mai, 1909.

(6) **Tayler, H. P. and Jones, H. Lewis.—A discussion on treatment by ionisation or cataphoresis.** *Bristol Medico-Chirurgical Journal*, June, 1909.

(7) **Gradle, H.—Staphylococcus vaccination in phlyctenular disease.** *Ophthalmic Record*, June, 1909.

(8) **Cargill, L. V.—Rodent ulcer of right eyelid and nose, part treated by zinc ironisation and part by x-rays.** *Trans. Ophthalmological Society U.K.*, Vol. XXIX, Fasc. II, 1909, p. 153.

(2) **Lundsgaard's** paper forms a supplement to his former communication on the same subject, an abstract of which will be found in THE OPHTHALMOSCOPE, 1906, page 478. The four cases of lupus conjunctivæ then reported as having been cured by Finsen light, were kept under observation and found to continue well and free from recurrences. To these

are now added four more cases of lupus and four of tuberculosis of the conjunctiva, which were submitted to the light treatment with the same success. In the latter cases the number of applications varied between 17 and 24. Each exposure has to last from half an hour to one hour. The technical difficulties and the means of overcoming them are considered at great length. Lundsgaard uses the Finsen apparatus, but the Finsen-Keyn lamp can also be employed. Wherever feasible, the lid should be everted with Grönholm's lid forceps and a pressing glass applied in the usual way. But it is of interest that lid-eversion can be dispensed with by using a prismatic pressing glass which is inserted between lid and globe. Although the effect of the light rays is somewhat diminished, good results have been obtained in that way. The eye itself is protected from the light with pads of cotton wool. As the author remarks himself, light treatment is not capable of curing every case of conjunctival tuberculosis, for the disease may be in such an unfavourable locality that the technical difficulties become insuperable.

C. MARKUS.

(3) **Laas** records the case of a girl, aged 9 years, who suffered from bilateral interstitial keratitis in its severest form. A four weeks' course of mercurial inunctions effected no improvement. The mother of the child had died of phthisis. A positive cutaneous reaction after Pirquet was one reason more to try injections of tuberculin (T. R). Twenty-two injections were given in the course of five months. The dose varied between 1/1000 and 16/1000 m.g. The temperature was carefully controlled and never seen to rise above 100 deg. F. On the other hand, the local reaction was often very pronounced. A gradual improvement, not without an occasional relapse, and, finally, cure, were brought about by this treatment. The result of a single insufflation of air into the anterior chamber of one eye was negative. Tuberculin treatment proved highly successful in a second case, that of an adult with a family history of tuberculosis, suffering from interstitial keratitis. This patient received 15 injections, varying between 2/1000 and 8/100 m.g. C. MARKUS.

(4) **Angélis** reports the case of a young married woman, who, probably about the fourth month after syphilitic infection, developed iritis, accompanied by a red, ulcerated swelling over the insertion of the superior rectus. The author has no doubt whatever that this was a tertiary manifestation of unusually early appearance, although he does not argue the point. He points out that when the eye is affected with "precocious" tertiary syphilis the prognosis for the eye is particularly bad: perforation and atrophy are frequently the ending. This being so, "intensive" treatment was commenced at once. At the commencement of treatment the pupil was undilatable, vision abolished, but light projection good, T. + 1. Every day for eight days the patient received an intravenous injection of 1 c.c. of a 1 per cent. solution of cyanide of mercury. Atropin and warm compresses were also employed. At the end of the first week the dose was increased to 1·5 c.c. From this point improvement commenced and progressed rapidly; the injections were now given every second day. Treatment was commenced on July 25th, and on September 9th the state of the eye was most satisfactory. All redness had disappeared, and the swelling had melted away. Tension normal. At this date 32 injections had been given. There had been no diarrhœa, colic, or stomatitis. From September, 1907, till January, 1908, intravenous injections were alternated with the administration of potassium iodide. At the latter date V. = $\frac{1}{8}$—iridectomy later on expected to improve vision further.

ERNEST THOMSON.

(5) The increasing use of the arylarsonates, such as atoxyl, in modern medicine renders it of great importance to note the disturbances of vision

which this drug has caused, and **Beck**, as a member of the German Commission for the study of sleeping sickness, has had much opportunity of seeing these cases, and he gives a short history of 23 cases which went completely blind, and 7 others in whom the disturbance was of a milder character. His report bears out the statements made by Gray, of the British Commission on sleeping sickness. Visual disturbance is seen both with large and small doses at all ages and in both sexes. The frequency with which the injections are repeated appears to have some effect: the more frequent the injections, the greater the liability to eye trouble. The ophthalmoscopic appearances may be quite negative, and only later on may the disc become white. The nature of the affection is a severe retro-bulbar neuritis affecting the chiasma and the tracts, the degenerative process being well-marked. It is interesting to note that trypanosomiasis tends to nerve degenerations, as does also syphilis, and in these affections the atoxyl group of drugs may be peculiarly liable to produce these disastrous results, although there is evidence to show that the arylarsonates are not free from danger in other affections. A. LEVY.

(6) In the course of a discussion upon treatment by ionisation, opened by **Tayler** (Bristol) and **Jones** (London), one or two points likely to be of some interest to ophthalmic surgeons were mentioned. Thus, Taylor had treated a lad suffering from granular lids by one application of I m.a. for two minutes, and the result was so good that the lad went to work and has made no complaints about his eyes since the application. Zinc ions were used on this occasion. Jones mentioned two cases of Mooren's ulcer (ulcus rodens) treated by ionic medication. One case was completely cured after a single application of zinc ions, and the other after two or three. He suggested that treatment by ionisation might be of service in granular lids and other affections of the conjunctiva. SYDNEY STEPHENSON.

(7) **Gradle** (Chicago) draws a clinical distinction between the first and subsequent attacks of phlyctenular disease. He has treated nine case of the last-named variety, which failed to improve under ordinary treatment, by staphylococcus vaccination. In all these cases smears from the conjunctiva showed the existence of staphylococci. In every instance improvement, uncertain after the first vaccination, "continued at a regular rate after the second or third, at the most." Recurrences, however, were not obviated by the treatment. One case alone, an instance of superficial phlyctenular keratitis in a girl of ten years, is given in detail, but it is not very conclusive as to the value of the treatment. SYDNEY STEPHENSON.

(8) A man, aged 80 years, consulted **Cargill** (London) on account of two rodent ulcers, one involving the right side of the nose, and the other the right lower eyelid. The former had existed for about fifteen, and the latter for about five years. The nasal legion was treated by ionisation with 25% zinc sulphate on three occasions, lasting 7, 25, and 20 minutes respectively. Healing was complete in nineteen days. On the other hand, the palpebral lesion was not completely cured after 20 applications of the x-rays.

SYDNEY STEPHENSON.

BOOK NOTICES.

History of Iridotomy. Knife-Needle versus Scissors. Description of Author's V-shaped method, by S. Lewis Ziegler, A.M., M.D., D.Sc., Chicago. Reprinted from Transactions of Section on Ophthalmology of the American Medical Association, 1908.

Ziegler has prefaced an account of his own method of iridotomy (and capsulotomy) with an historical review of the various methods of operating on an iris membrane since the days of Cheselden, the "father of iridotomy." This historical account is very interesting, although marred considerably by the niggledy-piggledy numbering of the figures. Cheselden, in 1728, originated the method of incision by the knife-needle. Janin, in 1768, abandoned this procedure, and originated the scissors method, which was later improved by Manois and afterwards by de Wecker, while von Graefe reverted to the knife-needle method. Ziegler himself argues in favour of the latter, and has had twenty years' successful experience with it. His particular method consists in the introduction at the upper part of the cornea of a specially-made modification of Hay's knife-needle, perforating the iris membrane (say) down and out, cutting through it by extremely light sawing movements to just beneath the point of corneal puncture, lifting the knife, swinging it to the down and in position, perforating the membrane again, and making the same sawing incision until the second incision joins the first. The second incision must terminate a trifle inside the extremity of the first, in order that the last fibre may be severed and allow the apex of the flap thus cut out to fall down behind the lower part of the iris-membrane. The steps of the operation (which evidently requires considerable manipulative skill and the very best of cutlery) having been detailed, there follows a list of the causes of failure with notes as to the way to avoid them. A few cases are recounted illustrative of the way an apparently most unpromising eye may be given more or less useful vision, and, finally, the author shows how his method "is *par excellence* the best way of incising a delicate secondary capsular cataract." That the pamphlet is profusely illustrated will be evident by the fact that in 35 pages there are 50 figures of eyes and instruments, in addition to a reproduction of Richardson's portrait of Cheselden.

Ernest Thomson.

Transactions of the Ophthalmological Society of the United Kingdom. Volume XXIX, Fasciculus II, 1909. London: J. and A. Churchill, 7, Great Marlborough Street. Price 4s. net.

The second fasciculus of the *Transactions* of the Ophthalmological Society, which should rightly appear towards the end of April or thereabouts, was issued to members of the Society on July 8th last. It is obvious that this late appearance of the fasciculus defeats one of the chief reasons for publishing the *Transactions* in parts instead of in one volume at the end of the session as formely. When every allowance is made for the tardiness of authors it is difficult to condone the belated issue of the present fragment, which contains 128 pages only, and which is without index or even table of contents. The communications it contains will be abstracted in due course in the columns of The Ophthalmoscope. There is, however, nothing of momentous interest.

Extraction of Cataract with a Lance-shaped Knife. By J. H. CLAIBORNE, M.D., New York City. (Reprint from *Transactions American Ophthalmological Society*, 1908.)

The special pleading of Claiborne for the use of a specially-designed keratome, in preference to the Graefe knife, will probably strike European oculists as quite unconvincing. The number of points of consideration of the Graefe knife (with which results, as we know, can be obtained that are almost impossible to excel) is only equalled by the number of points in which, according to Claiborne, the keratome is to be commended. As a matter of fact, the author finds twelve points of criticism of the Graefe knife, as used for cataract extraction, and since, as regards each one of these twelve, the keratome is more or less free from criticism, one may formulate the somewhat jocular conclusion that the keratome is twelve times as good as the Graefe knife. Such a conclusion is probably as good a one as can be drawn from what are (as regards some of them), dare we say, false premises.

Meyrowitz Bulletin (European Edition.) Published by E. B. Meyrowitz, of London, Paris, and New York. Midsummer, 1909.

The European edition of the *Meyrowitz Bulletin* describes and illustrates several appliances of interest to ophthalmic surgeons. The scotomagraph, devised by Mr. J. H. Tomlinson, is an ingenious device for testing the sensibility of the retina. The Edridge-Green colour perception lamp has already been noticed in these columns (THE OPHTHALMOSCOPE, April, 1909, p. 253.) The new pattern instrument costs five guineas, but Messrs. Meyrowitz have in stock a number of the last pattern lamps, which they are prepared to sell at half price, and although these lamps are not quite so convenient mechanically, they are in no way inferior to the new pattern optically. A projection spectoscope, the invention of Mr. J. H. Tomlinson, has been designed as an adjunct to the various methods in use of testing colour-blindness by the actual spectrum. The spectrum in Tomlinson's instrument is produced by means of a Nernst lamp and a diffraction grating, and it is projected on to an opal screen by mirrors placed in the path of the rays. Sutcliffe's keratometer has been fully described in the April, 1909, number of THE OPHTHALMOSCOPE, p. 235, and so has McNab's retinoscope (*Ibidem*, February, 1909, p. 81.) Wurdemann's and Sachs' transilluminators are figured and described. Among other appliances we may mention a new model Worth's amblyoscope, Bardsley's scotometer(THE OPHTHALMOSCOPE, November, 1908, p. 867), the Skeel perimeter, and the Meyrowitz registering perimeter (*Ibidem*, April, 1909, p. 253.) Other appliances mentioned in the *Bulletin* include tables and stools suitable for eye work, Berger's loupe, with and without electric attachment, and a new test type that goes by the name "Diaphanad." The last-named is of transparent glass, and is lighted by transillumination, the intensity of which can be graduated.

Cataract Extraction (being a series of papers with discussion and comments read before the Ophthalmological Section of the New York Academy of Medicine, 1907-8). Edited by DR. J. HERBERT CLAIBORNE. New York: William Wood & Co., 1908. Pp. 169.

The editor of this book of 169 pages, during his incumbency of the office of President of the Section of Ophthalmology, New York Academy of Medicine, 1907, instituted a "symposium" on cataract extraction. A different

surgeon was selected to read a paper on each occasion, each surgeon having been considered especially fitted for the task assigned to him. The papers, which are here collected together, have already been published in various medical journals. Each article having been written to order, so to speak, the material necessarily lacks something of the vigour and freshness of spontaneous effort. The whole, however, forms most interesting reading and fully serves its purpose in giving authoritative expression to modern American opinion and practice in the subjects dealt with. Everything of importance is discussed in the various sections, and the editor has included two papers describing instruments designed by him.

The first chapter is by J. E. Weeks on the stage of cataract most suitable for operation. Weeks prefers the removal of unripe cataract to artificial ripening. (This question is discussed again later in the book.) He had found, in a somewhat limited experience, that in extraction after ripening by Förster's method as much cortical matter was left behind as would probably have remained if no ripening had been attempted. In cases where the lens is much swollen, however, early operation is to be avoided, owing to difficulties introduced by shallowing of the anterior chambers. No age limitation is considered, nor is the condition of the cortex mentioned, apart from swollen lenses. Weeks removes zonular cataracts also without preliminary discission, frequently omitting iridectomy also. The results are satisfactory with subsequent discission.

Edgar S. Thomson is careful to note the vascular tension and to look for evidences of arterio-sclerosis before operating, hoping thus to avoid the risk of expulsive hæmorrhage. Two deaths were mentioned, one by Weeks and one by Claiborne, after operation upon diabetic patients. Such patients should always be placed on suitable diet and treatment beforehand. Though some American surgeons use bichloride of mercury solution for washing out the conjunctiva before operation, the conviction appears to be fairly general that this solution possesses no advantage over less irritating applications. A mouth protector does not seem to be usually worn by the surgeon.

The relative merits of simple and combined extraction are discussed in two chapters. In the first, Edward B. Coburn enumerates sixteen advantages of the simple method, and deals with the same number of objections to it. He states: "Certain it is that with all the danger of prolapsed iris, the relative proportion of suppuration, iridocyclitis, glaucoma, and sympathetic ophthalmia is not so large as that resulting from other methods of operating," In support of this he quotes Ring's collated statistics (*Medical Record*, February 23rd, 1895) of 1,032 extractions by recognized operators in America and Europe. He endorses Knapp's opinion that "simple extraction is not only the best, but also the safest operation for senile cataract and many other cataracts."

J. H. Woodward writes as an exponent chiefly of the combined operation. He has followed Trousseau in dispensing with the use of speculum and of fixation forceps—this both for combined and simple extraction.

Coller and Weeks think that more and more combined operations are being done, partly because more immature cataracts are being extracted.

In F. Valk's experience, the results of preliminary iridectomy have been the worst, but others spoke in favour of it.

Percy Fridenberg gives a careful and sound description of the *technique* of cataract extraction. He makes a conjunctival flap extending almost the entire length of the section. He thinks irrigation of the anterior chamber perhaps the most valuable of recent modifications in *technique*.

Claiborne describes the bent lance-shaped keratome which he considers suitable for the section in cataract extraction. The blade is 10 mm. long from point to base, and measures 14 mm. along the base-line. Apparently, he had not used the knife at the time of writing, but had used a smaller blade in one case only.

A. E. Davis is of opinion that all incarcerations of the iris after operation should be treated as prolapses, for nine-tenths of them become prolapses finally. H. Knapp and R. Denig, on the other hand, think that small prolapses should be left alone. Davis's resort to the cautery in the treatment of prolapses of over forty-eight hours' duration is scarcely to be commended as likely to be effective in warding off infective complications.

The open and "modified open" treatments of the wound do not apparently find favour in America. A number of surgeons prefer to leave the dressing untouched for two days or longer after combined extraction.

Denig thinks that discission for after-cataract should never be performed within three weeks after the extraction. He punctures through the cornea and seals up the puncture with the cautery whenever a thread of vitreous enters the opening. Weeks even seals up the opening thus in all cases in which aqueous escapes.

A short chapter by W. B. Marple is devoted to extraction of the lens in its capsule. But it can scarcely be considered up to date now, for recently American ophthalmologists have shown considerable interest in Smith's operation.

T. R. Pooley writes upon the artificial maturation of cataract. His own particular method is indirect massage of the lens after simple paracentesis. Clairborne describes his "lance-shaped harrow," designed to ripen cataract by multiple incision of the lens capsule. The instrument had then only been used upon one eye. None of the surgeons who discussed the question of artificial ripening were in favour of it.

There is a short chapter by W. E. Lambert on the treatment of high myopia by removal of the lens. And H. W. Wooton concludes by considering the final results of cataract extraction.

The book is well printed and bound. The only illustrations relate to Claiborne's two instruments. H. HERBERT.

CORRESPONDENCE.

[While *The Ophthalmoscope* will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE DANGER OF PLATED EYE INSTRUMENTS.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

In the *British Medical Journal* of July 3rd, 1909 (and elsewhere) Dr. W. C. Rockliffe, of Hull, reports a case in which he lost an eye apparently through entrance into it during operation of a piece of plating from an instrument. While Dr. Rockliffe is to be sympathised with in having to excise an eye after operation, he must be congratulated on having the

services of a nurse who was observant enough to secure and to draw attention to "something unusual" at a time when its significance was unknown.

It is an ill wind that blows nobody good, and all surgeons, more especially perhaps ophthalmic surgeons, must be thankful that attention has been drawn to this possible source of—I think not usually considered—danger. Its importance led me to make inquiries about the plating of eye instruments made by their firm from the representative of one of the leading instrument makers when he called on me to-day. He tells me that the only eye scissors which are plated are the iris scissors of de Wecker and of McDougall; all scissors for other purposes are not plated and the de Wecker are not plated on the inside cutting and opposing surfaces. No eye knives or large scissors or needles of any description are plated, but all needle holders and forceps (including iris forceps) are plated unless especially ordered otherwise. Almost all German-made instruments are plated.

Yours, etc.,

ARTHUR GREENE, M.A., M.D., F.R.C.S.
(Assist. Surgeon Norfolk and Norwich Eye Infirmary.)

NORWICH, *July 14th*, 1909.

NOTES AND ECHOES.

Deaths.

THE death is announced, at the age of 77 years, of Edmund M. Russel Rendle, consulting surgeon to the Royal Plymouth Eye Infirmary. From 1866 to 1893 Mr. Rendle filled the post of surgeon to the Eye Infirmary, and in 1896 he was elected President of the Institution. He retired from practice some ten years ago. The death is announced of William Brown, consulting medical officer of health for the City of Carlisle. The deceased gentleman for many years maintained a private dispensary at Carlisle for the gratuitous treatment of affections of the eye.

* * * *

Mr. Snell's Will.

MR. SIMEON SNELL, whose death we all deplore, left estate of the gross value of £30,451, with net personalty of £26,883.

* * * *

A New Eye Department.

A new eye department, which has been placed under the charge of Mr. E. C. Green, of Derby, has been opened at the Burton-on-Trent Infirmary.

* * * *

Appointments.

R. R. JAMES has been appointed Assistant Ophthalmic Surgeon to St. George's Hospital, London. Sydney Stephenson has been re-elected Ophthalmic Surgeon for a further term of five years to Queen Charlotte's Hospital, London. Eugen

v. Hippel has been nominated to succeed Hermann Schmidt-Rimpler, who is on the point of resigning the professorship of ophthalmology in the University of Halle. The appointment, in the first instance, was offered to Greeff, who, however, preferred to remain at the Berlin Charité. Joseph Imre has been appointed professor of ophthalmology in the University of Clausenberg in succession to Dr. Hóoz. The title of professor has been bestowed upon Dr. Zimmermann, of Görlitz, and Dr. v. Pflugk, of Dresden. H. Gebb has been recognized as *privat-dozent* of ophthalmology in Greifswald.

* * * *

v. Zehender.

On the 21st May our venerable colleague, v. Zehender, formerly Director of the Rostock University *Augenklinik* celebrated his 90th birthday. It is pleasant to record the fact that he enjoys excellent health. It will be remembered that in the year 1886, v. Zehender delivered the Bowman Lecture before the Ophthalmological Society of the United Kingdom.

* * * *

The Nettleship Medal.

On July 9th last the Nettleship Medal was presented to Mr. Edward Nettleship. Mr. Priestley Smith, acting on behalf of the President of the Society, Mr. R. M. Gunn, made the presentation in a few well-chosen and appreciative words, alluding specially to Mr. Nettleship's recent work on the pedigree of eye disease. Mr. Nettleship briefly thanked the Society.

* * * *

Ophthalmological Society.

The following office-bearers for the session 1909-10 were appointed at the Annual General Meeting of the Society, held on July 9th last :—

President.—G. A. Berry.

Vice-Presidents.—W. H. H. Jessop, R. A. Reeve (Toronto), Priestley Smith (Birmingham), Gustavus Hartridge, Joseph Nelson (Belfast), James Taylor, M.D., J. C. Uhthoff (Brighton), R. Marcus Gunn, J. Tatham Thompson (Cardiff).

Treasurer.—J. B. Lawford.

Librarian.—W. T. Holmes Spicer.

Council.—Harold Grimsdale, W. T. Lister, C. Devereux Marshall, Cyril H. Walker (Bristol), Arnold Lawson, William G. Laws, A. Maitland Ramsay, F. E. Batten, M.D., E. Brewerton, J. H. Parsons, C. H. Usher (Aberdeen), W. W. Sinclair (Ipswich).

Secretaries.—J. Herbert Fisher, E. Farquhar Buzzard, M.D.

* * * *

The Oxford Meeting.

The Oxford Meeting was held on July 15th and 16th last, and was in every way a great success. It was attended by many ophthalmic surgeons, both British and foreign. The programme, as usual at these meetings, was of an attractive nature. There were several addresses, some of considerable interest, and

none of any great length. No discussions were invited. Numerous demonstrations were given, amongst others, by Rayner D. Batten, Treacher Collins, R. W. Doyne, Greeff (Berlin), Edridge-Green, Bishop Harman, Thomson Henderson, J. Jameson Evans, Freeland Fergus, A. W. Ormond, A. Knapp (New York), Angus McNab, J. H. Tomlinson, Arthur Thomson, P. A. Adams, and Rémy (Dijon). The operations performed in the theatre of the Radcliffe Infirmary proved one of the most popular features of this charmingly informal gathering. Professor Deutschmann, of Hamburg, operated upon several cases of detachment of the retina by his operation of bisection. Dr. Motais, of Angers, demonstrated his operation for ptosis. Professor Dufour, of Lausanne, operated upon a case of absolute glaucoma by the modified Gayet iridectomy, described at length in the present number of THE OPHTHALMOSCOPE. Dr. Freeland Fergus operated upon a case of glaucoma by his operation of trephining the sclera, and also demonstrated his method of advancing the recti muscles. Colonel H. Herbert demonstrated his operation for glaucoma. Other attractions were a series of interesting eye cases shown at the Oxford Eye Hospital by Messrs. Doyne & Adams.

On the first day of the meeting a garden party was given by Professor Osler, regius Professor of Medicine in the University. The conference, which was voted an unqualified success, ended on July 17th by a launch excursion on the Thames from Oxford to Reading.

Several firms exhibited novel instruments and optical appliances.

* * * *

A New Ophthalmological Congress.

ON July 15th, at a meeting held in the Common Room, Keble College, Oxford, it was determined to place the Annual Meeting at Oxford on a permanent footing. Mr. Sydney Stephenson (London) moved, and Dr. R. A. Reeve (Toronto) seconded, the following resolution :—"*That the time has now come when it is advisable to place upon a permanent footing the Annual Meeting at Oxford of those interested in Ophthalmology.*" The motion, which was supported by Professor Deutschmann (Hamburg), Professor Motais (Angers), Professor Marc Dufour (Lausanne), Dr. Wendell Reber (Philadelphia), Dr. Vail (Cincinatti), Dr. L. Werner (Dublin), Mr. R. J. Coulter (Newport), and Dr. H. Walker (Glasgow), was carried without a dissentient voice. It was then moved by Professor Osler, seconded by Mr. F. M. Granger (Chester), supported by Professor Gotch, and carried *nemine contradicente*, "*That the Oxford Ophthalmological Congress be and hereby is constituted.*" Lastly, on the motion of Dr. Hill Griffith (Manchester) and Mr. Rayner D. Batten (London), a provisional committee (with power to add to their number) was appointed to make the necessary arrangements and to report in due course. The committee consisted of Sir Anderson Critchett, Bart. (London), Sir Henry Swanzy (Dublin), Dr. George Mackay (Edinburgh), Professor Osler (Oxford), Dr. Hill Griffith (Manchester), Professor Greeff (Berlin), Professor Dufour (Lausanne), Professor Deutschmann (Hamburg), Dr. Darier (Paris), and Dr. Wendell Reber (Philadelphia), together with Mr. Robert W. Doyne, as Chairman, and Mr. Sydney Stephenson, as Secretary.

* * * *

Religion and Medicine.

THE following letter, which casts a curious side-light upon the methods of some so-called religious sects, was published in a recent number of our contemporary, the *Transvaal Medical Journal*:

Dear Sir,—I should be glad if you could publish the following in your journal, as it may be of interest to the profession.

Extract—published about November, 1908—from what appears to be the official organ ("God's Latter Rain") of a religious sect whose meeting-house is at the corner of Von Weilligh and Bree Streets, Johannesburg:—

"Letis Saunders, of 32, De Korte Street, Braamfontein, Johannesburg, testifies: 'My eyes were so bad, my sight was almost gone, and my eyes were sunken and withered. I was treated by several doctors. Dr. Brinton, an eye specialist, Dr. Pursehouse and Dr. Blood and others. The doctors said my sight had always been defective and could not be healed. I went to the tabernacle, and Jesus healed me as the brothers prayed. Now my eyes are perfectly well and all the pains are gone.'"

Extract from notes on Letis Saunders in my case-book, dated June 27th, 1903 ($5\frac{1}{2}$ years before above publication):—

"Letis Saunders, age 9 (sent by Dr. Pursehouse), scarlet fever $2\frac{1}{2}$ years ago, then under Dr. Blood. Evidently at that time had phlyctenular conjunctivitis and photophobia. Phlyctenules now occasionally with nasal discharge.

R.V. $\frac{6}{6}$ Fundus normal.
L.V. $\frac{6}{18}$ Fundus normal, but dark and invisible at YS. due to some corneal opacities left from phlyctenules.
Corneal opacities visible only against fundus reflex. Field normal.
L.V. $= \frac{6}{6}$ c. $+2{\cdot}50$ under Homatropine.
Nov. 7, 1904. L.E., Corneal ulcer treated.
Nov. 21. L.V. $\frac{6}{6}$ improved c. $+{\cdot}75$ sphr. sine Homatropine ordered for R. and C.W.

By the comparison of these notes with the statement in "God's Latter Rain," it will be seen that the statement attributed to me is a complete fabrication and that the patient had complete full vision, her right eye was normal and left eye only departed from normal by a slight scarring which, in course of five years would, in all probability, have cleared up by the use of ung. hyd. ox. flav., as ordered.

While apoligising for the publication of the names of the other two doctors, I am perfectly certain that they never made such a statement as "sunken and withered."

I should be glad if you will see my note to vouch for the accuracy of my copy.

Yours faithfully,

ARTHUR G. BRINTON, F.R.C.S., Ed.

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ORIGINAL COMMUNICATIONS.

THE SIGNIFICANCE OF OPTIC NEURITIS.*

BY

J. S. Risien Russell, M.D., F.R.C.P.,

PROFESSOR OF CLINICAL MEDICINE, AND PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL; AND PHYSICIAN TO OUT-PATIENTS, NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN SQUARE, LONDON.

I am much indebted to the Congress, and especially to Mr. R. W. Doyne, for the privilege of making this brief contribution on the significance of optic neuritis. I wish, however, that the occasion had afforded me the opportunity of opening a discussion on the subject instead of reading the kind of paper that is expected of me, for there is much that I want to learn from you, and this would have been an excellent opportunity for me to obtain the information. As this is not possible, I must content myself by bringing to your notice some of the problems connected with optic neuritis which puzzle the physician, and in the elucidation of which you can do much to help him.

Even after excluding the surgical aspect of the subject, dealt with by Sir Victor Horsley† last year at this Congress, the title of my paper embraces so much that it is impossible to pretend to include all that might be expected, for the time at my disposal is—fortunately for you limited. There is no department of medicine or surgery in which the cause of an optic neuritis may not be discovered, so that this morbid condition links ophthalmology to every other branch of medicine and surgery in a way that cannot be claimed with as much show of reason for any other affection of the eye. This is probably not sufficiently recognised by physicians and general practitioners, who are, as a rule, too much inclined to regard optic neuritis as of necessity an indication of grave intracranial mischief.

I cannot pretend to deal with the most important aspects of the subject from the ophthalmologist's point of view, but hope that what I have to say from the standpoint of the physician may not be entirely without interest to you, and that it may serve to direct your attention to the ways in which you may help us in elucidating the problems with which we are confronted in which optic neuritis plays a part.

I do not propose to discuss the cases in which optic neuritis proves one of our most reliable guides to a correct diagnosis, but rather to ask your attention to those cases in which difficulties in diagnosis arise. I do not refer to difficulties in deciding whether optic neuritis exists or not, or whether hypermetropia or some congenital anomaly accounts for what suggests optic neuritis, for in such cases we can always fall back on the ophthalmologist and obtain his assistance in our difficulties. It is rather the cases in which there is no doubt about the neuritis, but much uncertainty as to its cause, that I propose to consider.

Let me take a common example of how such conditions may arise.—Otitis media may lead to such grave intracranial complications as sinus thrombosis, meningitis, or abscess, and the physician may be asked to decide whether an abscess which calls for surgical intervention is present or not. At the very outset he is confronted with the fact that there are those who assert that otitis media may occasion optic neuritis without any of the intracranial

*Read before the Oxford Ophthalmological Congress on July 15th, 1909.
†The Ophthalmoscope, September, 1908.

complications to which I have just referred, so that he enters on his investigations robbed of the aid of one of the most important indications of grave intracranial mischief, and has thus to make up his mind on a difficult subject without the valuable assistance that might otherwise have been derived from optic neuritis.

It is not with abscess, however, that the physician is most concerned, for these cases usually fall into the hands of the surgeon without filtering through the physician. It is otherwise with intracranial tumour. This is the chief problem with which the physician is concerned when he is confronted with optic neuritis, and he has to attempt to decide whether the neuritis is due to the presence of tumour or whether it can be otherwise satisfactorily explained.

Many of the difficulties of the physician would be removed if from examination of the eyes alone it could be determined, with any degree of certainty, whether some toxic agent or altered blood state is responsible for the optic neuritis, or whether a gross intracranial lesion is to be blamed. No such certainty, however, exists in the present state of our knowledge, for although it is true that with a gross intracranial lesion, such as a tumour, the appearances presented by the optic neuritis are very different from those which are revealed when a toxic blood state, unattended by increase of intracranial pressure, is to be held responsible, the conditions may be most misleading, and may cause increase of intracranial pressure to be suspected when none exists, while an altered blood state may be blamed when in reality increase of intracranial pressure is present.

We may not have to seek far for the cause of the optic neuritis, for this may be only too evident—as, for instance, when the other signs that are present leave no room for doubt that an intracranial tumour exists, or that abscess, meningitis, or sinus thrombosis accounts for the changes in the fundus. On the other hand, the difficulty may be so great as to make it impossible to say what is to be regarded as the cause of the neuritis, so that although the existence of the phenomenon enables us to be sure that organic disease, as opposed to functional disturbance, must be held responsible for the symptoms, there is nothing in the characters of the neuritis to establish with even a reasonable degree of probability which of the many organic causes of optic neuritis is in operation. Many such cases are ascribed to tumour, when the subsequent history falsifies this opinion, and makes it certain that no such grave view was ever justified. The circumstances under which the symptoms developed may have been such as to make it impossible to believe in any theory that sets up an infection or toxic agent as the cause, so that in the absence of notable anæmia, a tumour is naturally suspected. In trying to evade so serious a diagnosis as that of tumour, it is probable that too much stress has at times been laid on anæmia, for I cannot help feeling that this is a much over-rated cause of optic neuritis, and that anæmia does not exist in material degree in a large number of the patients in whom it is held to account for the condition. A trifling anæmia is thus assumed to be the cause owing to the fact that we are at a loss to determine any other to account for an optic neuritis which we should otherwise feel obliged to regard as the result of a tumour, a diagnosis from which we shrink in the absence of sufficient justification for so grave a view. I have met with one case only in which optic neuritis was associated with anything that could be justly spoken of as anæmia, and this occurred so many years ago that I hope that my scepticism, however unwarranted, may not seem wholly without reason.

Apart from the consideration that chlorosis is so common, while optic neuritis in a case of the kind is so rare, it is not a little singular that a disorder of the nervous system, in which profound anæmia forms part of the

clinical picture, should never be accompanied by optic neuritis. I refer to the disease known as subacute combined degeneration of the spinal cord, in which there is an acute destruction of the nerve elements, together with an altered blood state, leading to grave anæmia, and finally to marasmus and to death. It is true that although anæmia was originally regarded as the cause of the degenerative changes in the nervous system, the weight of evidence is now in favour of regarding these changes and those in the blood as due to a common cause—some toxic agent—rather than, as formerly, of ascribing the spinal degeneration to anæmia. Nevertheless, it might reasonably have been expected that a toxic agent so deleterious in its action on the nerve elements in the spinal cord, would have had similar baneful effects on the optic nerves, with neuritis as a consequence, especially in the presence of such grave anæmia as obtains in these cases.

Considerations of the kind add weight to the view that when optic neuritis occurs in a case of anæmia it is not due to the effect of an altered blood state on the optic nerves, but rather to intracranial thrombosis of a sinus or vein, a view that finds further support in the fact that paralysis of one of the ocular muscles may accompany the optic neuritis in a way that makes a common cause in every degree probable. This being the case, an intracranial thrombosis has been regarded as infinitely more likely than an altered blood state acting directly on the optic nerves, as well as on one of the nerves which supply the ocular muscles. The degree of anæmia is, however, often so trifling as to justify the greatest scepticism as to whether it can reasonably be blamed as a direct cause or as acting indirectly by producing thrombosis or any other complications.

As headache is a notable feature in most cases of the kind, it is reasonable to suspect an intracranial tumour if we feel justified in abandoning the view that anæmia is responsible for the neuritis; but in the absence of any other *data* on which to base the diagnosis, it cannot be made until syphilis has been first excluded. Convincing as the proof may seem in support of syphilis when the morbid phenomena disappear under a course of antisyphilitic treatment, this cannot be accepted as final and beyond further question, for conditions that are not syphilitic may also yield to similar treatment, and may even disappear without any treatment at all. Of far greater importance is the evidence to be derived from Wassermann's serum test, or lumbar puncture, with the estimation of the number of lymphocytes present in the cerebro-spinal fluid (cyto-diagnosis), for if the former test be positive and an excess of lymphocytes be determined in the cerebro-spinal fluid, there is no reasonable ground for doubting the syphilitic nature of the lesion responsible for the optic neuritis.

Those of you who are interested in the subject cannot do better than consult the Morison Lectures delivered by Dr. Mott before the Royal College of Physicians of Edinburgh in January of this year, and published in the fourth volume of his *Archives of Neurology and Psychiatry*, a contribution that is characterised by that degree of excellence which is inseparable from his work.

Assuming for the moment that these tests prove negative, and that we feel justified in excluding syphilis in a case in which no toxic agent or altered blood state has been proved, should disseminate sclerosis be included among the disorders to be excluded before we accept the diagnosis of tumour in a case in which optic neuritis forms part of the clinical picture? This is a question that demands close attention from ophthalmologists, for although the subject has not escaped your notice, I venture to submit that it is not improbable that some confusion exists, and that when it is said that optic neuritis may form part of the clinical picture of disseminate sclerosis, some

qualification of the statement is required. Is it that the term optic neuritis has been applied indiscriminately to include cases in which the phenomena determined in connection with the eyes are only in accord with what obtains in retrobulbar neuritis ; or do those of ordinary optic neuritis ever form part of the clinical picture of this disease, and, if so, with what degree of frequency ?

In a large experience of disseminate sclerosis, I have never met with a single instance in which I have been able to determine optic neuritis in this disease. The condition present has either been one of primary atrophy of the nerves, or the phenomena have been those which are ascribed to retrobulbar neuritis. This leads me to suspect that when it is said that optic neuritis occurs in disseminate sclerosis, retrobulbar, and not ordinary, optic neuritis, is meant. The importance of deciding this question will be obvious when it is remembered that the clinical picture of diseminate sclerosis may closely resemble that produced by a cerebellar or some other form of intracranial tumour for which an operation may be deemed advisable.

If my suspicion proves correct, I cannot help feeling that it is a pity that the term retrobulbar neuritis ever became applied to the condition which obtains in disseminate sclerosis, for although the clinical manifestations tally with those which obtain in a case of retrobulbar neuritis, the morbid process responsible for them is none other than that which obtains in other parts of the nervous system, and is in no sense a neuritis, in spite of the fact that it happens to affect the optic nerves.

Even when all the more usual causes of optic neuritis have been excluded, and there seems no reasonable probability that anything but an intracranial tumour remains that can account for the neuritis and other clinical phenomena that are present, the subsequent course of the patient's illness may falsify this diagnosis, in that improvement results, such as could not be expected in the case of a tumour. It then becomes tempting to surmise that a simple cyst, or a tuberculous mass that has become quiescent, has been responsible for the symptoms, or perhaps for the first time serous meningitis, as described by Quincke and others, is considered as a probable cause. Suggestions of the kind are, however, little better than mere conjectures, so that under the circumstances it would be far better to admit inability to arrive at a positive diagnosis of the real cause of the optic neuritis and other intracranial symptoms. These cases are far from uncommon, and mistakes of the kind have come within even my more recent experience. They re-open the question as to whether disseminate sclerosis may not account for the clinical picture in these cases, if it be admitted that ordinary, as opposed to retrobulbar, neuritis occurs in this disease. We are all familiar with the cases of disseminate sclerosis in which failure of sight, with or without recovery, obtains in the history long before the patient comes under the notice of the physician for the more general features of the disease, by which time all that can be determined on ophthalmoscopic examination is indistinguishable from what is regarded as characteristic of a primary atrophy of the optic nerves. It is practically impossible, as a rule, to keep in touch with patients who have suffered from optic neuritis and afterwards recovered, for a sufficiently long period of time to show positively whether these may not account for some of the cases in which a history of failure of sight is obtained in disseminate sclerosis. Tempting as it is to accept this explanation, it is not a little singular that we never see optic neuritis in the developed disease in the way that would almost certainly obtain if it is possible for it to occur at an earlier stage in the clinical history of the malady.

The class of case now under consideration is important, if for no other reason than that recovery may result in so far as all the other symptoms are

concerned, and yet the patient may be left blind owing to optic atrophy consecutive to the neuritis. No case of the kind has been allowed to terminate in this way without operation when I have seen the patient early enough to make it worth while to recommend surgical intervention. I advise trephining, for I entirely concur with the opinion expressed to you by Sir Victor Horsley last year, that no case of optic neuritis, due to increase of intracranial pressure, should be allowed to go on to atrophy and blindness, when by opening the skull and dura mater sufficiently freely the sight may be saved. I had not the pleasure of hearing Sir Victor Horsley on that occasion, so that I do not know whether he has been correctly reported as having said that all cases of optic neuritis, without the qualification I have introduced, should be submitted to operation. I am not in a position to subscribe to so general a statement, and so must qualify it in the way I have done. Some cases of the kind, however, come under observation too late, when optic atrophy is already far advanced, while others of them improve, and the neuritis subsides without leading to atrophy, and without its becoming necessary to advise operation.

Before concluding, I may perhaps be permitted to add that I am also entirely in accord with Sir Victor Horsley in considering that optic neuritis may have not only a diagnostic, but also a localising value, and that the eye which presents the older and more severe neuritis usually corresponds to the cerebral hemisphere in which the morbid process, which is responsible for the increase of intracranial pressure, is most likely to be found.

THE ÆTIOLOGY OF TRACHOMA.*

BY

PROF. DR. R. GREEFF,

BERLIN, GERMANY.

IN response to your invitation, I have the honour of reporting the progress made during the last few years regarding the ætiology of trachoma.

With many other authors, I had always been of the opinion that trachoma was a well-characterized disease, which did not develop from any other disease, but which was simply caused by a specific germ. In short, that it was a specific infective disease.

Modern hygiene has proved that it is only possible effectively to combat an epidemic by having a thorough knowledge of the causative agent of the disease—that is, a knowledge of the specific microbe, its existence, development, and its mode of spreading and transference. Such hideous epidemics as cholera, typhus, and bubonic plague as occurred formerly will not happen in future.

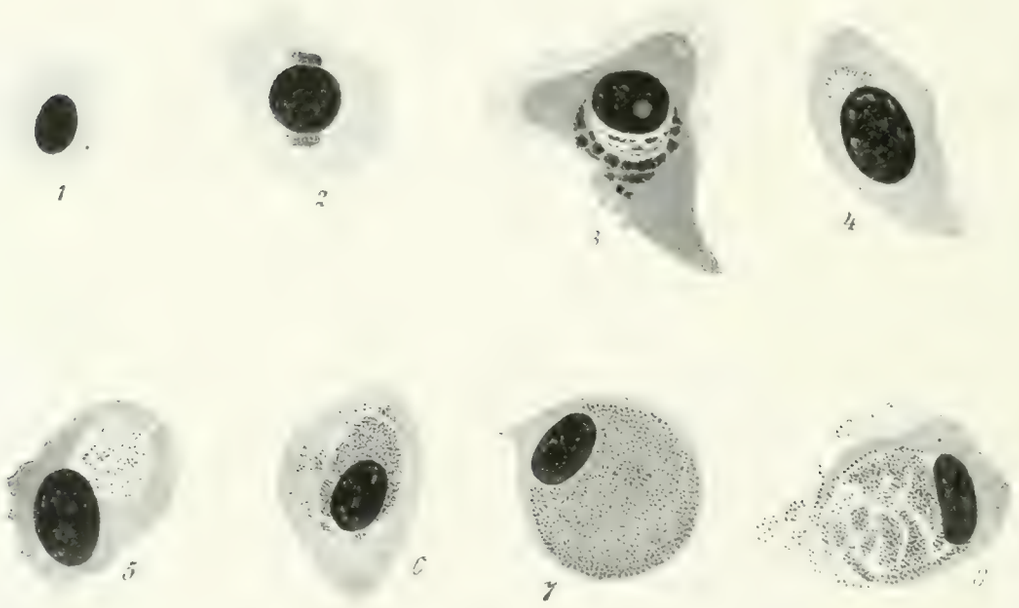
You are aware that during the last ten or fifteen years there have been increasing investigations in the ætiology of trachoma, but without bringing forth any appreciable result. I myself, in fact, after years of patient work, had given up all hopes of ever discovering the microbe of trachoma. We were at last in the position to say: "It is certain that with the known methods, it will never be possible to determine these microbes. It is useless to continue the work." And further: "It is not possible that they are bacteria in the known sense. Perhaps they are higher organised microbes, protozoa, or similar species." This was what I thought after having employed all known methods of staining and cultivating bacteria. Then, I made inoculations in

*Read at the Oxford Ophthalmological Congress on July 16th, and at the Belfast meeting of the British Medical Association (Section of Ophthalmology) on July 29th, 1909.

THE ÆTIOLOGY OF TRACHOMA,

By Professor R. Greeff,

Berlin, Germany.



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rabbits' eyes for Schaudinn, whose early death we all regret, the discoverer of the spirochæta pallida, the microbe of syphilis, and I had the opportunity of observing his specimens. I was able to find the spirochæta pallida in syphilitic keratitis parenchymatosa.

But during this work I never forgot my idea of applying these technical progresses to the investigation of trachoma. On the basis of the new staining methods of Levaditi, Romanisky, and Giemsa, I was led, then, to take up the matter once more. Indeed, as with other investigators, I found on the surface of the conjunctiva organisms belonging to the spirochæta formerly, not only in trachoma, but in every conjunctiva, which had been irritable for any length of time, as in the mucous membrane of the mouth, of the sexual organs, etc. They were, however, only saprophytes.

But soon, using the Giemsa method of staining, which has given so many excellent results in all protozoal diseases, as malaria, etc., I was always able to obtain a certain characteristic result in trachoma. I made this discovery first in collaboration with my assistant Dr. Clausen, and later with Professor Frosch, of the Institute of Infectious Diseases in Berlin, travelling in the most infected provinces of Germany, as Posen, East Prussia, Rhine Province, etc. (Berlin and its surroundings are almost free from trachoma.)

The bodies I found were very regular round cellular inclusions, which were much smaller than the smallest known coccus. They stain intensively, sometimes violet, sometimes reddish or blue, with Giemsa diluted with aniline stains, and not at all with Gram. They are surrounded by a distinct clear zone. With the strongest powers of the microscope, one observes that they are not quite round, but a little oval, like bacteria with rounded extremities. Finally, they are isolated, or grouped in pairs or in masses. If intracellular, they lie close to the nucleus.

We found the formations in the epithelial cells, in the discharge, in the pressed-out follicles, and, indeed, everywhere they were looked for.

When we were making our investigations, two physicians, members of an expedition to investigate syphilis in Java, Halberstädter and Prowazek, published a pamphlet on the same subject. Comparing the two discoveries it was soon clear that they had found much the same bodies in Java that we had observed in Germany.

Prowazek calls the formations clamydozoa (*Manteltiene*, *i.e.*, organisms with mantles), and, indeed, often the granules, lying intracellularly in masses, are surrounded by a mantle, but more often they are not. Therefore this name is not yet acceptable. First, I called the formations "double-bodies," because they are sometimes inclined to lie in pairs, but this name is not appropriate either, and not suitable for all conditions. Consequently, I discarded this name and selected the name "trachoma bodies," which has the advantage of being at once quite indifferent and of suggesting nothing.

From the plate you may observe the development of the trachoma bodies, as they are seen intracellularly.

In Fig. 1 the double bodies make their appearance in the protoplasm. Two granules are distinctly stained, and surrounded by a clear zone. In Figs. 2 and 3 there are, close to the nucleus, spots stained dark-blue, the reaction of the cells against the intruding microbes, the so-called plastin clots (v. Prowazek). In Figs. 3, 4, and the following we have what I call the massed form of trachoma bodies, the most frequent and the easiest to recognize in the specimens.

The massed form is of irregular shape, at times oval, at times rounded, in the beginning very small, but gradually growing until it takes the form and the appearance of a raspberry.

In fig. 5 the mass is surrounded by a distinct and clear mantle; but you may observe that in the earlier stages (as figs. 1, 2, 3, 4) the mantle has not yet made its appearance, that it is already incomplete in the later stages (6), and has entirely disappeared in the last drawings. The mantle is therefore characteristic of one stage only.

Fig. 7 shows a smaller cell, densely packed with granules, the cell having burst and the granules having been set free.

Prowazek thinks that bursting is caused by the reagents used, but as it occurs only in cells which are filled to overflowing with granules and that very frequently, I am of the opinion that it is a natural process. The granules are lying, then, free between the cells and in the discharge, where they are seen congregated in larger numbers.

The best results we obtained by a modified Giemsa method of staining, as follows:

The secretion of the conjunctival sac is taken in the customary manner with a platinum loop and smeared as thinly as possible upon a cover-glass. The conjunctival epithelium is obtained either by superficially scraping the epithelium with the edge of a cover-glass, spreading it on the cover-glasses, as in making a blood smear, or it is obtained from the surface of the conjunctiva with a platinum-iridium instrument (*see* figure), similar to the old-fashioned scarificator, especially constructed for this purpose, and spread as thinly as possible on a cover-glass.

The preparation made in this way is allowed to dry in the air, and is then fixed for some twenty to thirty minutes in absolute alcohol. It is thereupon allowed to float for from six to nine hours (if possible at a temperature of about 37° C.) with the smeared side down, upon the staining fluid, which is a mixture of 12 parts of Giemsa's eosin solution (2.5 ccm. of the French 1 per cent. eosin solution in 500 ccm. of distilled water), 3 parts of azur I (1 : 1000), and 3 parts of azur II (0.8 : 1000).

As the trachoma bodies are so frequently and easily seen in the epithelial cells, several authors have considered trachoma to be a purely superficial and epithelial disease. I do not agree with them for the following reasons:—

1. We know, clinically, that the trachomatous process goes very deeply into the tissues, intruding even into the tarsus, and, finally, destroying it.

2. As I observed in cases in which the trachoma bodies are frequent, they absolutely disappeared from the surface after a few days of treatment. But they reappear immediately if the treatment is stopped. This proves, I believe, that although they were absent from the surface, they still remained in the tissue itself, making their reappearance on the surface again and causing a relapse.

3. I succeeded in finding the granules in the pressed-out follicles. But by this method the material is always contaminated by the surface cells. Therefore I gave the task of obtaining the bodies in sections to an Italian physician, Dr. di Santo, working in my laboratory at the time, and he succeeded, so that now, through his work, we are able to localise the bodies. We do not see them in the epithelium alone, but also in the sub-epithelial tissue, in the lymph spaces beneath it, in the cells of the follicles (the lymphoid and the so-called Leber's cells), and between the cells.

After so many failures and incorrect reports concerning the causative agent of trachoma, questions constantly arose in my mind concerning my own discovery. I kept it, therefore, to myself for a long time.

First, it was necessary to prove that these formations were found only in cases

of trachoma and in no other disease of the conjunctiva. This has now been done. They never occur in conjunctivitis simplex, follicularis, diphtheritica, gonorrhoica, vernalis, etc.

On the other hand, we found these bodies in every recent case of trachoma in Posen, Berlin, Königsberg, and in the Rhine Province. They have now been found, further, by Halberstädter and Prowazek in Java, Mijaschita in Japan, Leber in Austria, v. Krüdener in Russia, and Finlay in Cuba.

It is certain that they are a constant characteristic of trachoma.

What is their nature? We were able to prove that the bodies were different from all known cell degenerations; especially they must not be confounded with the eosinophile-granules in the leucocytes. The bodies have, no doubt, some resemblance to those described by Negri and Guanevi.

But we observe them growing in the cells and see them vanish under treatment; therefore, for this and for other reasons it is very probable that they are a living agent.

All this leads me to think that the eagerly sought pathogenic organism of trachoma has now been finally found.

It would be as yet premature to attempt to assign to the trachoma-bodies their place in the zoological system. They are certainly not bacteria. On the contrary, they are more closely allied to the protozoa.*

*The following references to "trachoma bodies" may be found in recent numbers of THE OPHTHALMOSCOPE :—

1. **MacNab, Angus.**—April, 1909, p. 261.
2. **Stanculeanu, G.**—June, 1909, p. 395.
3. **Herford, E.** -June, 1909, p. 431
4. **Clausen, W.**—June, 1909, p. 431
5. **Greeff, R.**—June, 1909, p. 432.
6. **Greeff, R.**—July, 1909, p. 494
7. **Pusey.**—September, 1909, p. 633.

EDITOR.

CLINICAL MEMORANDA.

A CASE OF HORSE-POX (VARIOLA EQUINÆ) IN MAN.

BY

N. C. RIDLEY, F.R.C.S.

OPHTHALMIC SURGEON TO THE LEICESTER INFIRMARY.

The comparative rarity of this case is my justification for recording it.

There is very little account of the disease as affecting horses in the veterinary text-books. Finlay-Dunn (*Veterinary Medicine*) says :—"Variola equinæ, or horse-pox, a specific contagious fever, depending upon a microbe affecting the skin and mucous surfaces and passing through papular, vesicular, and pustular stages. It is of rare occurrence." Williams (*Principles and Practice of Veterinary Medicine*) states that it affects the buccal and nasal mucous membranes and occasionally the conjunctiva, and is transmissible from horse to horse, cow, or man, by contact and inoculation only.

Friedberger and Fröhner (*Veterinary Pathology*) distinguish two diseases:

(*a*) True variola, probably originating from smallpox in man and identical with cowpox, said to be extremely rare. The skin behind the pastern is frequently attacked, probably from the fact that this site is frequently touched by shoeing smiths or grooms who may have been recently vaccinated.

(*b*) English horse-pox, or dermatitis contagiosa pustulosa, a benign highly contagious disease, probably identical with contagious impetigo in man.

My friend, Mr. C. Haywood, M.R.C.V.S., of Leicester, under whose care was the horse from which the patient contracted the disease, however, informs me that the complaint is comparatively common in this part of the country in the spring and early summer, and is most frequently seen in the stables of horse-breakers, who have a great number of young animals passing through their hands, and whose men are proverbially careless with regard to the cleanliness of the bits and other parts of their harness. That, consequently, inoculation occurs of the mucous membrane at the angle of the mouth or of the skin near the axilla. That the disease runs a mild course, the animal usually recovering in about three or four weeks, little or no treatment being required. That one attack protects, and that the incubation period is about 6—8 days.

My case was as follows :—

John I., age 50, stableman, came to the Leicester Infirmary on July 16th, 1909, stating that four days previously he had what he thought was a stye on the left lower lid, but that since that time his eye had become much swollen. He had been taking care of a horse for fourteen days which had sores about the mouth and axilla.

On examination, there was intense œdema and inflammation of the left eyelids, much chemosis, and a profuse purulent discharge from the conjunctiva. The cornea was clear, the pupil dilated, there was no definite iritis, but the vision was dim. Near the centre of the lower lid, on the conjunctival surface, was an indurated swelling about 15 mm. across, with a grey sloughy base, somewhat resembling an Hunteran chancre. The pre-auricular gland was enlarged and tender, and the tissues around were œdematous and red as though about to break down, and many glands in the anterior triangle of the neck were similarly affected, although to a less degree.

My house-surgeon, fearing that it might be a case of glanders, admitted the man to an isolation ward and inquired of Mr. Haywood the affection from which the horse was suffering, who reassured him in that respect. Microscopical examination and agar-agar cultures merely showed typical colonies of staphylococcus pyogenes albus and aureus.

Boric fomentations were applied, the eye was frequently washed with chinosol lotion, and an ointment containing Hydarg. Oxid. Flav. gr.ij c. Atropin gr.ss to the ounce, inserted three times daily. A mixture of iron and quinine, with arsenic, was also prescribed.

Two days later the swelling was much reduced, but the discharge was still very profuse, while along the lid margins were numerous circular white vesicles, about 3 mm. in diameter, with depressed centres; there were a few white patches on the conjunctiva, but these were flatter and less distinctly vesicular.

The cornea remained clear throughout.

The vesicles broke down and then healed, all the symptoms gradually subsided, and in eight days the patient was discharged. There was never any rise of temperature in spite of all these severe symptoms. The large indurated sore, which was apparently the site of inoculation by means of the patient's finger, is disappearing slowly but promises to leave no trouble. The man could not say when he inoculated himself, so the incubation period could not be exactly determined, but from the history given above, it evidently did not exceed ten days.

The man had been vaccinated when an infant, but not since.

This case was more like the true variola of Friedberger and Fröhner than English horse pox, the secondary eruption being distinctly vesicular and bearing no sort of resemblance to contagious impetigo.

It is interesting that this disease should be comparatively common in badly vaccinated Leicestershire ; and also that the site of inoculation should be most frequently noted where it would be when acquired from another animal (mouth and axilla) and not where it would be when acquired from man (behind pastern).

MILTON'S BLINDNESS.*

BY

PROFESSOR M. DUFOUR,

LAUSANNE, SWITZERLAND.

A LATIN letter written by Milton to Philaras, a Greek diplomat, living in Paris, gives us the most authentic information on the state of Milton's eyesight. Philaras having received all information from Milton himself concerning his eyes, undertook to consult, on his behalf, Thevenot, a Parisian oculist.

In the last ten years, since 1644, Milton had noticed that his eyesight was failing, at the same time he was suffering from spleen, internal pains, and flatulence. Whilst looking at a torch he would see a halo round the flame. To begin with, he noticed, on the left side of his left eye, a shadow which hid from him all objects placed on that side. In shutting his right eye, the objects placed in front of his left eye seemed smaller. The shadow finished by obscuring completely the vision of the left eye. After this, during three years, the sight of his right eye slowly and gradually grew dim. Before entirely losing his sight, the motionless objects he looked at appeared to float about. Obstinate steam seemed to hang round his forehead. Nevertheless, as soon as he lay down, either on the right or the left side, a brilliant light shone before his closed eyes. As by degrees his blindness increased, ever darker-growing colours troubled him ; they finally settled in an ashen blackness. This cloud, in which he was enveloped day and night, was more like dawn than night ; when he moved his eye it still received a faint light, as if through a crack. Milton's eyes were in this state in 1654, the date of the letter to Philaras ; their external appearance was normal, no cloud veiled them. The malady reached its climax in the year 1652.

In 1654, Milton, in a sonnet to his friend, Cyriac Skinner, writes :—

"Syriac, this three years day these eyes, though clear,
"To outward view, of blemish or of spot,
"Bereft of light their seeing have forgot,
"Nor to their idle orbs doth sight appear
"Of sun, or moon, or star throughout the year,
"Or man, or woman.

From these documents I deduce the following facts : (1) a dimness of the visual field coming on first on the left side and then at the top ; the sensation of steam before the eyes, showing the well-known picture of the narrowing of the visual field from above (or from the top). (2) The deformed character and mobility of the objects. (3) The subjective sensations of light, which persist even after the loss of sight.

These symptoms lead undoubtedly to the conclusion of a detached retina, which would account for all three symptoms. The way in which the illness began, first in the left eye, with loss of sight starting from the left side, and then in the right eye, with the loss of the upper part of the visual field, confirms this supposed diagnosis.

* Read at the Oxford Ophthalmological Congress on July 15th, 1909.

What was the cause of this great infirmity? No mention is made of a shock, or of any injury. On the other hand, Milton himself tells us that since the age of 12 he worked daily until midnight; and who knows with what light? His great thirst for knowledge led him to work incessantly. In 1638 he travelled to Italy, crossed the Channel, stopped a short time in Paris, passed through Nice, the Riviera, Pisa, Leghorn, and after two months' stay in Florence, he went on to Rome and Naples. From there he was called back to England by the unsettled state of affairs. On his way back he stopped at Rome, Florence and Venice; then, crossing the Alps by the St. Bernard pass, he reached Geneva, where he spent a few weeks. In this way he saw some of the most beautiful parts of the world—as, for example, the Genoa Riviera, the Gulf of Naples, the beauties of Florence and Rome, St. Mark of Venice, the Alps, and the Lake of Geneva. In his works there is not one description given, not one line, referring to the beauties of nature. On the other hand, he takes a keen interest in his fellow creatures. He saw Grotius in Paris; he listened to Galileo at Fiesole, to Cardinal Barberini at Rome, and to Diodati at Geneva. Although in the seventeenth century no thought was given to the beauties of nature, this attention to things heard, and indifference to things seen, appears to be the chief characteristic of the shortsighted.

From these characteristics and from the intensity of his studies, the number of his works, no less than fourteen books published between his return to England in 1639 and 1656, the date when, already blind, he began his great work Paradise Lost, we conclude that Milton was afflicted from his earliest youth with progressive short sight. His devotion to his work increased his short sight, which at the age of thirty-six brought on detachment of the retina, first in the left eye and then in the right.

Is this a consolation? It is a very small one to think that, were Milton alive to-day, we might diagnose his case more correctly than did the doctors of his day; but, alas! very little better than they, could we cure him?

A CASE OF RETRO-OCULAR NEURITIS.

BY

Dr. NASR FARID,

MANSOURAH, EGYPT.

Aly, aged 25 years, consulted me on the 25th May, 1909, with the history that after a night spent in the fields cutting the crops, lumbago had developed, and he had also lost his sight. There was no history of syphilis, tubercle, or alcohol. He is married, and has one child, a boy.

On admission.—Pupils dilated and immobile. V. = finger-counting at 10 c.m. Unable to recognize colours. Optic disc congested, and retinal arteries small. Exudation around the retinal veins. Macula prominent. Urinalysis negative. A diagnosis was made of descending intra-ocular neuritis, the result of cold.

The patient was treated by potassium iodide and in addition to that, hypodermic injections were given of strychnine sulphate and mercury cyanide, one each day. Three days later, the patient had altogether lost the sight of both eyes. At this stage the opinion was asked of Mr. A. F. MacCallan, chief inspector of the Egyptian Ophthalmic Hospitals, who confirmed the diagnosis, and endorsed treatment of the patient with iodide and hypodermic injections of strychnine. Twelve days after this, the man was able to count fingers, and on July 22nd, 1909, he could recognize with the right eye the hand at 2 metres and with the left eye the hand at three metres. Colours could also be recognised. There remained, however, a large central scotoma for white and for red.

OPERATION FOR PTOSIS BY THE SUBSTITUTION OF A FLAP FROM THE SUPERIOR RECTUS MUSCLE.*

BY

Dr. MOTAIS,

ANGERS, FRANCE.

1st stage.—Having everted the upper lid, stretch the upper fornix with two sharp hooks, one being inserted into the sclerotic above the cornea, and the other into the ciliary margin of the everted upper lid.

2nd stage.—Cut the conjunctiva over the insertion of the rectus muscle, prolonging the incision beyond the lateral limits of the tendon. Separate the sub-conjunctival tissue and capsule of Tenon, so as to expose the tendon.

3rd stage.—Pass a large strabismus hook under the tendon, from the inner side, and raise the tendon.

4th stage.—With a double-toothed forceps, seize the centre of the tendon three or four millimeters from its insertion ; then with a curved scissors, make a central incision, four millimeters broad, quite close to the sclerotic, in front of the forceps.

5th stage.—Take hold of the "sectioned" portion of the tendon with a broad pointed fixation forceps, so as to stretch it out well. Then, with straight scissors make two parallel incisions upwards, one at each side of the tendon, thereby making a flap one centimeter in length.

6th stage.—Raise the small flap, and pass a catgut or reindeer tendon suture, by means of two curved needles, through the flap, near its free border. Tie the suture, which thus seizes the centre of the tendon in its grasp.

7th stage.—Incise the central portion of the conjunctival cul-de-sac with the curved scissors, pass the blades between the tarsus and the soft tissues, and separate the former from the latter by a few snips of the scissors, up to the ciliary margin of the lid, so as to make a path in the substance of the lid for the flap of tendon.

8th stage.—Pass one of the needles in through the space thus made, and bring it out through the skin near the ciliary margin. The flap will be thus drawn up. Pass the second needle in a similar manner, bringing it out a few millimeters from the other. Tie the ends over a pledget of lint.

9th stage.—Suture the conjunctiva with catgut.

10th stage.—To prevent lagophthalmos, raise the lower lid until it comes into contact with the upper, by means of a suture passed through the lower lid near the ciliary margin, and then through the skin of the eyebrow, and draw it sufficiently tight.

UNIVERSITY OF OXFORD: DIPLOMA IN OPHTHALMOLOGY.

The statute referring to the holding of an examination in ophthalmology by the University of Oxford was published in THE OPHTHALMOSCOPE of April last (p. 251). By the courtesy of the authorities, we are now enabled to give the regulations, as approved by the Board of the Faculty of Medicine, which govern the examination. They are as follows :

1. The Examination shall be conducted partly in writing, partly *viva voce*, and shall be partly practical.

* The operation was performed by Dr. Motais before the members of the Oxford Ophthalmological Congress on July 16th, 1909.

The subjects of the examination shall be :—

(1) The dioptrics of the normal and abnormal eye.

(2) Abnormalities and diseases of the eye and its appendages, their ætiology, pathology, diagnosis, and treatment,

(3) The relation of ophthalmology to general medicine.

(4) Clinical cases illustrating (1), (2), and (3).

(5) Ophthalmic surgery.

2. The fee payable by a candidate on admission to the examination, on the first occasion on which he offers himself, shall be £15, unless he is a graduate of the University, in which case it shall be £10. Any candidate who has paid such fee, and who offers himself for examination again on a subsequent occasion, shall pay a fee of £5 only.

3. The examination shall be held annually and shall commence on the third Tuesday in the month of July. The assistant registrar shall give at least one month's notice of the time and place.

4. The names of candidates shall be received by the assistant registrar. They must be sent in on forms provided by him for the purpose and to be obtained at his office, so as to reach him on or before the thirtieth of June preceding the examination. The suitable fee must be paid at the time of entering the name.

5. Candidates must have their names on the Medical Register of the United Kingdom, or, if they are graduates in medicine of Universities outside the United Kingdom, must obtain the permission of the Board of the Faculty of Medicine.

6. Candidates shall be required, at the time of entering their names, to produce the following certificates :—(i) *A certificate showing that the candidate has satisfactorily carried out in the University of Oxford the practical study of the anatomy of the eye and its appendages, including the development and minute structure of these parts. (ii) †A certificate showing that the candidate has satisfactorily carried out, in the University of Oxford, the practical study of physiological optics and of the physiology of vision. (iii) Certificates showing that the candidate has duly attended a course of clinical ophthalmology for twelve calendar months in connexion with hospitals or institutions recognised for the purpose by the Board of the Faculty of Medicine. (iv) ‡A Certificate showing that the candidate has satisfactorily carried out in the University of Oxford the study of the subjects of examination set forth in clause 1.

7. The Assistant Registrar may require candidates to give such further information as he may judge necessary to satisfy him that the provisions regarding admission to the examination have been properly observed.

8. Any candidate who has failed to send in his name as above prescribed shall be permitted to do so up to the seventh day before the commencement of the examination, on payment of an additional fee of two guineas.

*The course for this certificate would occupy one term in the Department of Human Anatomy.
†The course for this certificate would occupy one term in the Department of Physiology.
‡The course for this certificate would occupy three months.

REPORT OF THE COMMITTEE ON PREVENTABLE BLINDNESS,

Appointed at the International Conference on the Blind, held at Manchester in July, 1908.

Committee:

Chairman: MR. HENRY J. WILSON (London), Secretary of Gardner's Trust for the Blind; MISS E. WRIGHT (Wakefield), Organising Secretary of the North of England Union of Societies for the Blind; Councillor C. M. COLLINGWOOD (Exeter), Hon. Secretary, Superintendent of the West of England Institution for the Blind; MR. N. BISHOP HARMAN (London), M.A., M.B.Cantab., F.R.C.S.Eng.; MR. R. N. HARTLEY (Leeds). M.B., B.S. Lond., M.R.C.S.Eng.; REV. ST. CLARE HILL, M.A.Cantab. (Leatherhead), Principal of the School for the Indigent Blind, Leatherhead; MR. W. LITTLEWOOD (Liverpool), Superintendent and Head Master of the School for the Indigent Blind, Wavertree, Liverpool; MR. J. M. RITCHIE (Manchester), Schoolmaster at Henshaw's Blind Asylum; Councillor T. WARNER (Bradford), Member of the Executive Committee of the Institution for the Blind.

REPORT.

The subject of the prevention of the disease which so frequently causes blindness in newly-born infants is one that for many years has engaged the attention of all whose work has brought them into contact with the blind. At every conference that has been held during recent years relative to the welfare of the blind, whether at home or abroad, attention has been called to the urgency for taking satisfactory measures for the checking of this disastrous cause of blindness.

The medical libraries contain a host of papers and books which have treated of this disease, and of the blindness consequent thereon. Recent English literature has been summarised in the report of the British Medical Association Committee (*British Medical Journal*, May 8th, 1909), to which reference will be made further.

The gist of these papers is to the effect:—

1. That more than one-third of the blindness found in British Blind Schools is due to this one cause—infants born with good eyes are blinded by the disease within a few days of their birth. 2. The risk of blindness is entirely preventable by prompt and efficient treatment.

To this end it is now almost universally agreed, by both medical men and laymen cognisant with the subject, that the disease known as "The Ophthalmia of the New-Born" should be scheduled as Compulsorily Notifiable. And it is believed that by such action this appalling source of misery and helplessness would be checked.

In spite, however, of these urgent recommendations, no action has been taken by the British Public Health Authorities, nor have these Authorities, so far, availed themselves of their permissive powers to make the disease compulsorily notifiable.

At the International Conference on the Blind, held in Manchester in July, 1908, it was held that no sufficient steps had been taken to give publicity to the urgency of the matter. A representative committee was therefore appointed to consider the subject fully, and to make such recommendations as they might deem, not only advisable, but as likely to be of practical utility.

At the first meeting of this Committee two Ophthalmic Surgeons were co-opted as members of, and advisers to, the Committee :—Mr. Robert N. Hartley (Hon. Surgeon, Leeds United Institution for the Blind and Deaf and Dumb), and Mr. N. Bishop Harman (Oculist to the London County Council Blind Schools). These gentlemen were expected to advise on matters relating to the North and South of England respectively.

During the sittings of this Committee, another committee, instituted by the British Medical Association, has had this same matter under review. The two committees have acted upon quite independent lines, and the fact that they have arrived at similar conclusions and make virtually the same recommendations adds greatly to the weight of their recommendations.

The following are the recommendations of the Committee appointed by the International Conference :—

1. That in the opinion of this Committee the adoption by the Public Health Authorities of the Early Notification of Births Act is urgent.

2. That in the opinion of this Committee the disease known as the "Ophthalmia of the New-Born" should be added to the list of diseases compulsorily notifiable under the powers of the Infectious Diseases (Notification) Act of 1889.

3. That in the opinion of this Committee :—(*a*) More definite teaching should be given to midwives on the seriousness of eye disease in children ; and (*b*) They suggest that the Central Midwives' Board should issue more stringent instructions on the danger of "whites" in lying-in women.

With a view to obtaining more exact knowledge of the incidence of "blindness" in subsequent census returns, the Committee recommend that the Registrar-General should be requested to define and classify "blindness" in his schedules in some such way as the following :—

1. Stone Blind, *i.e.*, the individual has no power to see the movement of fingers before the eyes.
2. Partially Blind, *i.e.*, in the case of—
   - i. *Children.* Those who have not sufficient sight (even with the aid of glasses) to be taught in an ordinary school.
   - ii. *Adults.* Those who have not sufficient sight (even with the aid of glasses) to earn a living by ordinary means.

In conclusion, the Committee desire to emphasise the fact that the question is at the present juncture, and is likely to be in the future, of much greater importance than in the past. For the introduction and extension of the operation of the Employers' Liability Act is seriously affecting, and is likely to still more seriously affect, the earning powers of adult workers with defective vision.

(Signed)
HENRY J. WILSON, Chairman.
N. BISHOP HARMAN.
CHAS. M. COLLINGWOOD, Hon. Sec.
ROBERT N. HARTLEY.
EDITH WRIGHT.
THEO. WARNER.
WALTER LITTLEWOOD.
J. M. RITCHIE.
S. CLARE HILL.

June, 1909.

DETACHMENT OF THE RETINA REVIEWED.

BY

ERNEST THOMSON, M.D.,

SURGEON TO THE GLASGOW EYE INFIRMARY, ETC.

PART I.

Introductory.

THE following endeavour to survey the voluminous and wide-scattered literature of retinal detachment is the outcome of an attempt to review its treatment. A dive into this literature revealed its depths and also the impossibility of giving a rational review of treatment without a review of the ætiology. I became much interested in detachment of the retina, not merely in the treatment, which, as everybody knows, has always been characterised by extreme uncertainty, but in the whole pathological condition. The result has been the collection of a mass of literature of detachment, viewed from many points. In the hope that a study of this literature—as far as may be possible chronologically—may tend to a revival of interest in a disease process which has become typical of all that is most unsatisfactory in treatment, this and future articles have been planned.

To attempt a complete account of a subject, which has been a thorn in the side of the ophthalmologist for more than half a century, which has provoked the most acrimonious discussions, which has turned the sanguine to despair, and which has led distinguished ophthalmologists to recant as to the efficacy of one treatment or another, would be to write a monograph on a subject which seems interminable. What is intended, therefore, is a series of articles in which will be brought together recorded facts and opinions, more especially concerning things upon which there is not agreement, or of which the perspective has been lost through that perpetual swing of opinion from one side to the other which is apt to take place whenever a subject is not properly understood.

It is probably safe to say that, although we may be somewhat nearer the correct pathogenesis in 1909 than was von Graefe in 1854, we are no nearer certainty in treatment than were Sichel and others at about the same period, when they treated detachment with leeches in front of the ear and at the anus, with purgatives, with antimony, barium, colchicum, copper, mercury, iodide, with footbaths, fomentations, and fly-blisters. We read that re-attachment took place, *then relapse.* Can we do any better in 1909, with subconjunctival injections, sweatings, and operations? Indeed, as to operations, scleral puncture, the simplest and probably one of the best, dates back to the beginning of the nineteenth century at any rate. Sometimes it has succeeded; more often it has failed. Nor, as has been hinted, do we seem to know much more with certainty about the pathogenesis than we do about the treatment of detachment. One theory after another has been propounded to explain the fact that under very various circumstances the retina detaches from the choroid. It must be obvious that no single theory can explain all the facts, and yet, in many cases, the propounders of theories seem to be obsessed with the notion that their respective theories *should* cover all cases.

Such being the case, the articles upon ætiology and upon treatment will form the backbone of my work.

A few words may be said here on the subject of *classification.* It seems almost impossible to devise a satisfactory classification of an affection the

pathogenesis of which remains so uncertain. Differences in clinical type are not available either, since differences in appearance, situation, visual disturbance, and so on are not characteristic, or not sufficiently characteristic to build upon.

I propose to accept, in a general way, the classification of Abadie [1] into (a) symptomatic detachment, (b) simple detachment. Class (a) will embrace all detachments, including traumatic, which seem to be the result of some definite, local or general morbid process ; class (b) will include "myopic" and other so-called "idiopathic" or "spontaneous" detachments which come on without any very definite cause. Even this classification is open to objection, for, as Galezowski has indicated, detachment is never really "idiopathic." There is always a cause [2].

Ætiology.

Under the heading *ætiology* we have to consider *pathological anatomy* and *causes.*

The pathological anatomy of detachments which result from penetrating wounds of the globe is probably so well understood that it need not be taken into consideration. The chief interest and argument have been concerned with the anatomy of "simple" or "idiopathic" detachment. These cases come but comparatively seldom to the hand of the pathologist ; the following review of the pathological anatomy will, in consequence, be concerned almost entirely with this type. Such anatomical points as are of special interest in connection with symptomatic (including traumatic) detachment will be noticed when discussing causes. To give anything like a reasonable summary of a subject upon which no definite conclusion has been reached is necessarily difficult. It must be comparatively brief, and yet, in the present case, it must go back to the days of the introduction of the ophthalmoscope.

The causes, the numerous diseases and physical conditions under which detachment has been known to occur and to the agency of which it has been attributed, will form the second portion of this chapter.

Pathological Anatomy.

I have not attempted to go back beyond the time of von Graefe. That marvellous observer was aware in 1854 [3] of the various positions occupied by the detachment, of trauma and "sclerotico-choroiditis posterior" as causes of secondary changes in the undetached portions, of cataract, and resorption of the vitreous as consequences. At this time he regarded subretinal hæmorrhage as the chief cause. In 1857 [4] he explained detachment in "sclerotico-choroiditis posterior" as due to lengthening of the eyeball and insufficient elasticity of the retina, the result being a loosening of choroido-retinal connections.

In 1858 [5], he said, "there is sometimes a perforation of the retina with passage of subretinal fluid into the vitreous space and consequent vitreous opacities." He credited H. Müller with the observation.

Metaxas [6], in 1861, remarked that not only may the retina be detached from behind, but it may be dragged upon and detached from in front, and that the consistency and elasticity of the vitreous play a part in the production of this malady. When, as the result of intraocular inflammation, the vitreous has partly lost its elasticity and consistency, a small quantity of effused fluid can produce detachment. He also mentioned the curability of some cases, especially when the retina is torn.

Iwanoff,[7] in 1868, reported cases of detachment of the vitreous from the

retina, and stated that detachments of the retina may be the result of pathological changes in the vitreous, although more often resulting from an inflammatory process of the retina itself.

It is evident that from early ophthalmoscopic times there have been two main theories of the causation, the theory of sub-retinal effusion and the theory of vitreous traction. That the retina was often torn was noticed even by von Graefe, but the possible significance of the retinal tear seems to have been conceived first by de Wecker [8] who, in 1870, suggested that the sudden onset of detachment in certain cases is due to rupture of the retina, permitting the flow of fluid from the vitreous into the choroido-retinal space : *i.e.*, detachment *follows* rupture.

Poncet[9], in 1873, supposed that there was secretion of a serous fluid between retina and choroid, " migration of colloid products " into the vitreous, inflammation of the vitreous, and fibrous transformation of vitreous and retina.

In 1876, Raehlmann[10] brought forward his diffusion theory. He held that the retina acts as a dialyser. On one side of it is a saline solution represented by the vitreous fluid, and on the other an albuminous choroidal transudation. If, then, there be a sub-retinal exudate and a fluid vitreous, the two will change places in accordance with the laws of diffusion, *i.e.*, the saline fluid of the vitreous must dialyse more rapidly than the albuminous fluid from the sub-retinal space, and the retina ruptures as the result of the pressure exerted on it by the contained fluid ; *i.e.*, rupture occurs *after* detachment. Raehlmann, in support of his view, pointed out that the two fluids are different in colour, in albuminous content, and in specific gravity. The tendency of partial detachments to find themselves eventually in the lower part of the fundus is ascribed to the relatively high specific gravity of the post-retinal fluid as compared with that of the vitreous. If the vitreous be normal sub-retinal exudates cannot form without raising the intraocular tension. This theory, therefore, pre-supposes an affection of the vitreous, the *fluid* components of which are responsible for the detachment.

Galezowski[11], in 1877, realized that the disease is not a clinical entity, and that success or failure of treatment depended upon the pathogenesis.

Leber[12], in 1882, introduced the vitreous traction theory with which he associated the idea that rupture of the retina is an essential feature in detachment. He was supported by the anatomical researches of Nordenson[13] in 1885 and 1887. The Leber-Nordenson hypothesis [14] [15] may be briefly summarized as follows :—

A choroidal exudate, abundant enough to produce a large retinal detachment, could not collect in a few hours in the presence of a normal vitreous without causing great increase of intra-ocular pressure, while a tear of the retina permitting—as pointed out by de Wecker—the irruption of vitreous fluid into the retro-retinal space allows one to understand much better the suddenness of certain detachments. In every " ordinary " detachment there is assumed a retinal tear somewhere—Nordenson found it in more than a third of his cases ophthalmoscopically (Sinclair)—and these tears do not happen after the detachment, but have to do with its onset. What happens is that the vitreous becomes coarsely fibrillar and enters upon a progressive process of shrinkage. If the vitreo-retinal attachments be normal, the vitreous shrinks away from the retina except at the points where it is attached, namely, at the optic nerve and anteriorly, while the space between vitreous and retina is filled with fluid. Further shrinkage leads to traction on the retina at its attachments, the retina ruptures usually at the equator, the subhyaloid fluid reaches the posterior surface of the retina, and detachment is produced. Nordenson is obliged to admit that such a course of events is subject to

modifications. Notably, he does not deny that such forms of detachment as might be produced by a subretinal effusion may sometimes take place in rare cases, as in albuminuric retinitis. The vitreous changes are due to disturbance of nutrition, particularly those produced by inflammatory processes affecting the choroid (Sinclair).

From the time of its introduction the Leber hypothesis has had a very large number of adherents, although it seems now perfectly obvious that it cannot explain all the cases, as, indeed, has been pointed out by the very numerous writers who have discussed it. To go into the arguments *pro* and *con* the Leber-Nordenson idea is outside the scope of this article. I prefer to continue with the views of various writers. From these many of the points will emerge of themselves.

Although not in strict chronological order, it is convenient here to refer to the experiments of Sinclair,[14] published in 1901. This author, experimenting upon rabbits, found that if detachment be produced by the injection of normal saline behind the retina, such detachment tends to heal, but if, after causing detachment with saline, the latter be replaced by a blood plasma fluid, the detachment continues to increase. "Whether this increase of post-retinal fluid was due to choroidal transudation or to diffusion from the vitreous, it is difficult to say; but as there was no rupture of the retina seen, and as during the increasing stage of detachment the ocular tension was not raised, diffusion of the vitreous fluid was the more probable." Again: "It seems sufficiently evident that inflammatory processes in the choroid give rise to the albuminous character of the post-retinal fluid and may account for its primary formation. The increase of this fluid, and the consequent extension of detachment, often occurring rapidly and without increase of intraocular tension, can most readily be accounted for by the process of diffusion of the vitreous fluid through the retina, and in many instances where rupture is not present, cannot be accounted for in any other way." Sinclair's experiments, therefore, tend to support the Raehlmann theory.

Schweigger in 1882[16] admitted the great part played by retinal tears, and pointed out that they are often very peripheral and difficult to see. Mittendorf[17] believed in a twofold origin, exudative and tractive. Boucheron[18] injected into the extra-choroidal space (rabbits) cantharidate of soda. This caused the choroid to secrete a fluid which detached the retina and even traversed it, reaching the vitreous in the form of floating flakes and membranes. Diminution of tension followed in several days. Boucheron believed that the retina is first detached by fluid secreted by the choroid and is afterwards prevented from re-attaching by secondary cicatricial retraction in the vitreous; the principal predisposing cause being myopic cyclo- or sclero-choroiditis. Galezowski[19] held that retraction of the vitreous was secondary, and had only seen retinal rupture in 131 out of 649 cases[20]. Brailey[21] considered it impossible that the retina could be detached without rupture, and that the cases in which detachment was merely due to an exudate without disease of the vitreous were decidedly rare apart from intraocular sarcoma. Schweigger[22] raised the point that sometimes the pigment epithelium detaches with the retina and sometimes not. Landolt[23] drew a distinction between detachment and simple elevation of the retina. Galezowski[24 25 26] wrote many articles on the subject and eventually seemed to reach this conclusion:—retinal tears are not constant, only occurring with him 131 times out of 785 (discrepancy here, contrast previous reference). Retraction of the vitreous cannot be the primary cause, since to cause this the nutritive coats must be first affected. Detachment is due to alteration of the posterior lymph channels. When the anterior lymph channels are

affected, we get maladies of cornea and iris, and glaucoma. When the posterior channels, detachment of the retina.

In 1889, Abadie[27] expressed the opinion that pathologico-anatomical work had obscured, rather than elucidated, the pathogenesis. As the result of assuming that terminal lesions (consequences) were causal, a pessimistic view of treatment had resulted. Abadie himself held—apparently after Graefe—that detachment in myopia is due to progressive distention of the eyeball.

In 1891, Horstmann[28] of Berlin recognised two varieties of detachment according to the cause: (1) the exudative form which follows a choroidal affection; (2) the form which is due to shrinking of the vitreous In the first form the tension is normal. In the second form, *which is incurable without exception*, the tension is diminished and the retina usually torn.

Reboud[29] saw a traumatic case where the vitreous was completely retracted owing to effusion of blood. When the blood became absorbed there was no detachment of the retina. How, he asks, does this fit in with vitreous retraction theories?

In 1892, Elschnig[30] brought forward two cases which seemed to throw a light on retinal tears. In these cases there had been an antecedent chorio-retinitis which resulted in partial union between retina and choroid. When the retina detached a tear occurred at the points of union of retina and choroid, and Elschnig held that Nordenson was wrong in supposing that dragging of the vitreous is the main cause of retinal tears. In the two cases referred to the retinal tear was secondary to the detachment.

Four years later Treacher Collins[31] supported Elschnig's view with two similar cases. While not denying the possibility of inflammatory exudates into the vitreous acquiring adhesions to the retina, and ultimately causing rents in it, he thought the diffusion theory of Raehlmann offered much the most probable explanation of the ætiology of ordinary cases of detachment seen with the ophthalmoscope. A good deal of importance had been attached—by the vitreous retraction theorists—to the fact that the edges of the torn retina turn inwards. Collins pointed out that it is a matter of common knowledge that when any eye is cut open the edges of the retina roll inwards. He therefore attached no importance to this turning in of the edges of the retinal tear.

Nor did Leber's theory appear true to Boucheron[32]. In 1892 he wrote that, in youth, the vitreous after being displaced by the detached retina may regain its normal position in virtue of the elasticity of its fibres.

Scheffels[33] discussing, in 1894, the *treatment* which aims at bringing about adhesive chorio-retinitis by dry heat, stated that he had experimented upon rabbits, and found that detachment of the retina *resulted* from the application to the sclera of the galvano-cautery. Scheffels leaned to the exudative theory of detachment.

In 1896, an important communication appeared from J. P. Nuel[34] in which it is recognised that detachment of the retina may have a number of causal factors and that all of these may be in action at once. (A) The retina may be detached by œdema as in the macular œdema of Bright's disease. (B) it may be detached by *retraction of the retinal vessels*. Inflammatory alterations of the vessel walls diminish their extensibility and they tend to become displaced inwards so as to be related to the retina as the cord to a bent bow; thus they drag upon the retina. Nuel had twice seen in non-myopic eyes (ophthalmoscopically) fundal detachments commencing along the vessels: and in peripheral detachments it is not unusual to see finger-like prolongations extending towards the disc as if guided by the large vessels[35]. (C) If the vitreous retracts and leaves the hyaloid attached to the retina

at the posterior pole, the hyaloid may exercise strong traction on the retina, and Nuel presents figures in which the sustentacular fibres are seen drawn out of the retina as the roots of a plant might be drawn out of the earth. (D) If the hyaloid holds to both vitreous and retina, as it may do at the equatorial parts of the eye, then shrinkage of the vitreous transversely to the optic axis results in the hyaloid dragging the retina after it, so causing a peripheral detachment.

It must be noted that Nuel's anatomical work has been done on eyes with secondary detachment.

In 1897, Schmidt-Rimpler[36] stated that Leber's theory can only be accepted in quite a small number of cases, and that detachment is caused usually by a choroidal exudate. According to Leber, it is necessary to suppose (*a*) a retinal tear, (*b*) similarity of composition of the post- and pre-retinal fluids. In the great majority of cases neither of these conditions is fulfilled, and, further, often there is no sign of previous disease of the vitreous.

In 1898, Horstmann[37] who, in 1891, had expressed an opinion in favour of two forms, exudative and tractive, now held that detachment is caused by cyclo-choroiditis, followed by secondary alterations of the vitreous, but more through the action of a choroidal exudate than through traction of a shrivelled vitreous. Again, as showing the tendency to distrust the Leber-Nordenson hypothesis, Wicherkiewicz[38] may be quoted :—" We know that neither of the two existing theories (traction and exudation), is sufficient to explain all the cases, and sometimes they are even in disagreement with the results of ophthalmoscopic and anatomical examination." Deutschmann[39]—like Elschnig—held the opinion that rupture is due to the choroid and retina becoming adherent ; so that when pressure comes, the retina has to give way at the adhesions.

Gonin[40] in 1904, in the main adhered to the Leber-Nordenson hypothesis of attraction of the vitreous with early tear of the retina due to adhesions between vitreous and retina. He considered, on the basis of three cases which he had studied, that ordinary cases of spontaneous detachment, such as are seen in myopia, are really caused in the first instance by abnormal vitreo-retinal adhesions, the result of foci of chronic retinitis in the anterior regions of the eye. When the vitreous retracts it tears out a flap of retina. And it is because of the greater normal intimacy between the *vitreous* and retina in the anterior regions, that these tears occur there so very frequently as a result of pathological adhesions. Posterior detachments of the vitreous are commoner than is supposed, but owing to the lesser intimacy between retina and vitreous, a thin layer of fluid is sufficient to prevent adhesions between the two.

With regard to other forms of non-traumatic detachment, such as that accompanying tumour of the choroid or a neighbouring inflammatory process of the sclera, Gonin does not agree with Nordenson that the vitreous usually plays an active part. Further, in traumatic detachment the vitreous is not really the cause of detachment unless it has previously formed adhesions to the retina. Finally, Gonin reviews at considerable length the various objections which have been raised to Leber's theory.

Addario[41] in the discussion on Gonin's paper, and elsewhere, claimed to have filled up a gap in the theory of Leber, in that he had discovered that the fibres of Müller far forwards are continued into the vitreous. The retina is dragged upon at this part by the retracting vitreous. That is why the retinal tears occur far forwards. In the same discussion A. Terson[42] pointed out that there may be total liquefaction of the vitreous, or it may be reduced to a thin layer behind the lens, or to a liquid full of crystals, and yet the retina remains in its place. There must, therefore, be other lesions to account

for detachment. The extreme frequence of myopic detachment proves that the shape of the myopic eye, tractions on the retina, pigmentary chorio- and intra-retinal lesions are favourable to detachment. Vitreous adhesions and ruptures probably occur in certain cases.

In this same year, 1904, Wessely[43] published the results of his experiments on cats. A hollowed-out metal sphere heated to 100°C was applied to the sclera for one second. Extensive retinal detachments were produced similar to those seen in man. The detachment commenced immediately after the burn, reached its maximum in twenty-four hours, and disappeared completely in seven or eight days, leaving a red spot in its place. When the burn was more severe, the retina, instead of becoming detached, became soldered to the choroid. When detachment was produced it appeared to be due to an exudate between retina and choroid. Microscopic examination showed great choroidal hyperæmia. The intraocular tension was not sensibly increased, and in Wessely's view, it is impossible to say what becomes of that portion of the vitreous which is replaced by the exudate. Still in 1904, Deutschmann[44] gave expression to his views on the pathogenesis. The disease begins as a chronic choroiditis which interferes with the nutrition of the vitreous, so that this tissue shrinks away from the retina and leaves a space which fills with fluid. But if the transudation of the liquid is impeded the retina is thrust forward to fill up the space, and in this way a detachment is produced. In the later stages, and especially when partial or total recovery occurs, there are seen white bands and pigmentary disturbances which are so many evidences of chorio-retinitis. Deutschmann looks upon this inflammation as being like the perforation of the retina, an attempt at spontaneous cure.

In 1906 Best[45] stated that subcutaneous injections of phloridzin produce, *inter alia*, an exudate between the pigment-epithelium and the rods and cones. Similar exudates can be caused (*a*) by subconjunctival injections of irritating substances, (*b*) by partial cauterization of the sclera, (*c*) by intra-ocular infections. He held that most detachments consecutive to chronic iridocyclitis of whatever origin, diabetic detachments, and albuminuric detachments, are of exudative origin ; while spontaneous detachment is due to alterations of the vitreous.

In the discussion E. von Hippel[46] said that he had examined anatomically a detachment of the retina of only three days' duration, which had come on in the course of a sympathetic ophthalmitis. Between the retina and choroid there was a uniformly coagulated exudate. *The vitreous was perfectly normal.*

The foregoing incomplete and much-compressed review of the work which has been done on the pathogenesis of "simple" detachment, pretends to do no more than show the various sides of a very vexed question, a question which, however, some of the writers of text-books—and the best text-books too—seem to consider settled by the Leber-Nordenson explanation. That it is by no means settled will be agreed to, I imagine, by all who may read these chronological notes.

(To be continued.)

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46. **v. Hippel.**—Discussion on Best's paper above.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—THE EFFECT OF LIGHT UPON THE EYES.

(1) **Sissons, Ellet O.—A query into the effect of intense sunlight on the eye of the blonde type.** *Ophthalmology*, January, 1909.

(2) **Birch-Hirschfeld, A.—Changes in the conjunctiva produced by frequent exposure to rays of short wave length.** (Die Veranderungen der Bindehaut nach Laufinger Bestrahlung mit kurzmelligem Licht.) *XI Congresso Internazionale di Oftalmologia*, Fascicolo primo, April, 1909, pp. 91-95.

(3) **Best, F.—On the practical importance of eye injuries due to visible and ultra-violet rays.** (Ueber die praktische Tragweite der Schädigungen des Auges durch leuchtende und ultraviolette Strahlen.) *Klin. Monatsbl. f. Augenheilkunde*, May, 1909.

(1) The greater part of this paper of **Sissons** consists of a somewhat diffuse description of the distribution of pigment in the human eye and in the eyes of animals and birds, and a discussion of the effects of light on living protoplasm.

In the concluding section he refers to such diseases as snow-blindness, glass-blowers' cataract, and spring catarrh, known or supposed to be due to excessive exposure to rays of short wave length, and discusses the injurious effects of x-rays, radium-rays, and violet and ultra-violet light upon the eye.

As a point of practical importance he states that glass stops the passage of ultra-violet rays, while quartz allows them to pass, so that the wearing of glasses may serve to protect the eyes from harmful rays.

A. J. Ballantyne.

(2) **Birch-Hirschfield** finds that the rays from a uriol lamp cause photophobia, lacrymation, hyperæmia, chemosis, and a mucoid secretion. Microscopic examination of the conjunctiva shows infiltration of the submucous tissue with polynuclear leucocytes, lymphocytes, and some plasma cells, along with great vascular engorgement. The secretion is characterized by the presence of large numbers of eosinophile cells. The height of the reaction is reached in two or three days, when the changes begin to disappear. If the experiment is repeated before the effect of the first one has had time to pass off, the same results are produced with a shorter exposure. If the experiment is repeated for months, the palpebral conjunctiva becomes milky-white, newly-formed vessels show themselves in the form of numerous pink spots, and here and there the conjunctiva presents a tesselated appearance. The layers of epithelium increase greatly in number, and processes of epithelial cells are sent into the submucous tissues, where they may enclose cyst-like spaces. Plasma cells and lymphocytes abound. In the latter stage the epithelium becomes pigmented, the granules of pigment first appearing in the deeper layers, then gradually spreading to the superficial layers, where the pigmentation may become so dense as to obscure all the other features of the condition.

Percival J. Hay.

(3) **Best** examines critically the parts played by the visible and ultra-violet rays in the pathology of the eye. Leaving out the conjunctival affections, which are no doubt caused by ultra-violet rays, he reaches the conclusion that the danger of these rays to other parts of the eye has been exaggerated, while the import of too much of visible rays is apt to be overlooked. By exposure to the glare of sun-lit snow, Best produced erythropsia and an impairment of the red-green colour perception in one of his eyes, the pupil of which was artificially dilated, although this eye was protected from the ultra-violet rays by a yellow glass. On the other hand, looking straight at the midday sun for ten seconds through a uviol glass of 3 mm. thickness was of so little consequence that he was able to continue reading immediately after having exposed his eye to all the ultra-violet rays of the sun. While the injurious effect of the ultra-violet rays upon the retina is thus shown to be non-existent, that upon the crystalline lens under ordinary circumstances appears to be doubtful. It is true, cataract has been produced artifically by highly concentrated ultra-violet rays, but it would be a mistake to fear on that account the ultra-violet rays of our natural and artificial sources of light, as the conditions of the experiments and every day life differ widely. Perhaps glassblowers' cataract forms an exception. It follows that in practice the old-fashioned dark glasses afford the best eye protection from hurtful rays. C. MARKUS.

II.—CONGENITAL ANTERIOR STAPHYLOMA.

Collins, E. Treacher.—Congenital anterior staphyloma. *Trans. Ophthalmological Society U.K.*, Vol. XXIX, Fasc. 2, 1909, p. 169.

A baby, first seen by **Collins** (London) at the age of one month, had been born with the right cornea opaque and prominent, and with a central opacity of the left cornea. There was no discharge worth mentioning from the eyes of the infant, who had been born at term, after a non-instrumental labour. No history of ante-partum discharge from the mother. Family history unimportant. On examination, Collins found the cornea of the right eye opaque, vascular, enlarged, and staphylomatous. During the ensuing fourteen months, during which the child was seen at intervals, the cornea became somewhat more prominent. At fifteen months, the affected eye was eviscerated, and during the course of the operation an elliptical piece of the front of the eye, including the whole cornea, to which iris and lens adhered, was removed, and preserved in the usual way for pathological examination.

The chief pathological features of Collins's specimen may be described somewhat as follows.—The cornea was irregularly thickened, and its posterior surface was covered with uveal pigment except over an area which corresponded to the pupil, where there was a backward projection of the fibrous tissue composing the cornea. The surface epithelium was thicker than normal, and rested directly upon the laminated fibro-cellular tissue of which the cornea was made up. It is important to observe that no trace could be found either of Descemet's membrane or of the ligamentum pectinatum. The two pigment epithelial layers of the iris were here and there separated from the posterior surface of the cornea by collections of spindle-shaped cells, resembling the cells of the unstriated muscular tissues of the iris. As far as could be made out from the specimens, the anterior end of the ciliary muscle appeared to

arise from the fibrous tissues of the sclera, there being no ligamentum pectinatum for it to be attached to. A circular canal, corresponding to Schlemm's canal or to the circulus arteriosus iridis, was seen in all the sections in the posterior part of the fibrous tissue at the sclero-corneal margin. The crystalline lens, which (after hardening in formalin) measured 8 mm. by 2 mm., showed a conical projection (0·8 mm. in height) from its anterior pole, the most salient part of which, as in the normal lens, was covered by hyaline capsule, and a single row of epithelial cells. The angles formed by the junction of this prominence with the lens were filled in with tissue such as that which is met with in cases of capsular cataract. A considerable part of the posterior capsule was lined by cells.

Discussing the ætiology, Collins points out that there are two views : 1. that congenital staphyloma is the outcome of intra-uterine ulceration and perforation of the cornea, and 2. that it results from some defect in development. He discusses the evidence *pro* and *con*, and concludes that the absence of Descemet's membrane and the ligamentum pectinatum from his own case renders the first of the above-mentioned views untenable. He suggests an atypical development of the mesoblastic tissue which in early fœtal life grows in between the lens vesicle and the surface epiblast. No differentiation of the mesoblast into two parts takes place, as it should normally do, and no hyaline layer is formed. There is no Descemet's membrane and no fibro-vascular sheath, only a thick mass of fibrous tissue SYDNEY STEPHENSON.

III.—CHLOROMA.

(1) **Hall, F. de Havilland.—Chloroma.** *Proceedings Royal Society of Medicine*, March 1909, p. 157.

(2) **Hebb, R. G , and Bernstein, J. M.—Pathological report on case of chloroma.** *Ibidem*, p. 166.

Cases of chloroma are perhaps more apt to be seen in the first instance by ophthalmic surgeons than by other practitioners. It is therefore of consequence that we should be familiar with the signs and symptoms of that rare affection, which may be confused with leukæmia, and especially with supra-renal sarcoma associated with secondary growths in the orbit.

(1) **Hall**, of London, reports at some length a case of chloroma diagnosed during the life of the patient, a little girl aged $4\frac{1}{2}$ years. A fortnight before admission, the eyes became prominent, and at the same time the child developed a lump on each side of the neck. Headache had preceded by about two weeks the advent of these symptoms. *On admission.*—Anæmia. Yellowish discoloration of the upper lids, and prominence of the eyes. A hard painless, immovable lump was present on each side of the neck, extending from the mastoid downwards over the sterno-mastoid muscle, and forwards towards the ramus of the jaw. These masses had a greenish tint. Facial paralysis (due to pressure) on the right side. Double optic neuritis. There was a leucytosis affecting the large lymphocytes. *Progress and termination.*—The child was bright at first, but later she became drowsy and irritable when awake or roused from sleep. For a period of about four weeks there was a slight but steady gain in weight. The temperature fluctuated, but presented, as usual in these cases, nothing characteristic. Successive blood-counts

showed a steady fall in hæmoglobin (from 60 per cent. to 18 per cent.), and in the number of the erythrocytes (from 4,100,000 to 1,140,000), and to a less extent in the leucocytes. Death, which was due to asthenia, preceded by a great increase in the frequency of the respiration and circulation, occurred 47 days after admission to hospital, and within three months of the beginning of the disease.

(2) The pathological report upon the foregoing case by **Hebb** (London) and **Bernstein** (London) may be summarized as follows.—Characteristic greenish growths were found in the ethmoidal region, middle fossa and lateral sinuses of skull, orbits, and dura of the vertex. Olive-green growths also implicated the periosteal tissue of the malar, temporal, and sphenoidal regions. As regards the trunk, chloromatous tissue was found on the internal aspect of all

the ribs, the innominate bones and sacrum, and on the external surface of both scapulæ in the subspinous regions. The colour of the growths faded somewhat after the lapse of an hour of two. Micro-sections of obviously affected tissues showed that the growths consisted of round-celled sarcoma, best described, especially where it was periosteal, as a highly cellular fibro-sarcoma. The cytoplasm of many of the cells contained a pigment, which when examined in a fresh state under the microscope, was of a greenish-yellow hue, homogeneous, and oily-looking. No bacteria were detected. Hebb and Bernstein incline to believe that the disease started from the ethmoido-facial region, and they suggest that embryology might possibly yield the clue to what are the peculiarities in that region which give rise to the characteristic cells and pigment of chloroma. SYDNEY STEPHENSON.

IV.—EXTREME HYPERMETROPIA.

(1) **Lafon, Ch.—A case of curvature hypermetropia.** *Recueil d'Ophtalmologie*, janvier, 1909.

(2) **Harman, N. Bishop.—A case of extreme hypermetropia.** *Ophthalmic Review*, August, 1909.

(1) Hypermetropia above 10 dioptres is rare, and it is then generally axial and the radius of the corneal curvature hardly ever exceeds 7 mm. In **Lafon's** case, a child 6 years of age, the refraction was R. + 12D., L. + 14D. with + 2D astigmatism, and under atropine R. + 14D., L + 15.5D. The refractive power of the two meridians as determined by Javal and Schiotz's ophthalmometer was:—

Horizontal 15.75° = 31.25D = radius of curvature 10 mm. 80
Vertical 15° = 29.75D = „ „ 11 mm. 34

If the static refraction under atropine is added to these we have:—

Horizontal meridian 31 25D + 14D = 45.25D.
Vertical „ 29.75D + 15.5D = 45.25D.

But 45.25D is the refractive power of a cornea having a radius of curvature of 7.45 mm. which may be considered normal in a child six years of age; therefore, the hypermetropia in this case was entirely due to the corneal curvature. Clinically, the case presented interesting features. There was a history of some inflammation in the eyes at birth, but this had apparently subsided spontaneously. The globes appeared to be normal in size, but the corneæ looked small owing to a pseudo-gerontoxon which was marked above and below and was continuous with the scleral opacity. Focal illumination disclosed deep-seated corneal opacities. Seen in profile, the cornea seemed to have the same curvature as the rest of the globes. The left squinted and did not fix.

R.V. c. + 14D. = $\frac{1}{3}$. L.V. = $\frac{1}{100}$ not improved by glasses.

J. Jameson Evans.

(2) **Harman** (London) reports the case of a lad aged 12 years, who with plus 18D. spherical glasses obtained vision equal to 6/36 in each eye. The corneal diameter was 11 mm., the corneal radius, 6.9; the corneal dioptric value 50.75D.; the vertical axis of the globe, 16 mm.; and the antero-posterior axis about 19 mm. The patient possessed good binocular fixation.

Sydney Stephenson.

V.—OXYCEPHALY.

(1) **Carpenter, George.—A case of acrocephaly, with other congenital malformations.** *Proceedings Royal Society of Medicine*, December, 1908.

(2) **Carpenter, George.—Specimens of oxycephaly (Crâne en forme de tour—steeple skull) of an infant, æt 8 weeks.** *Trans. Ophthalmological Society U.K.*, Vol. XXIX, Fasc. 2, 1909.

(3) **Fletcher, H. Morley.—Four cases of oxycephaly.** *Ibidem*, March, 1909.

(3) **Stephenson, Sydney.—A case of oxycephaly.** *Ibidem*, June, 1909.

(1) A glance at the figure will show that the child exhibited by **Carpenter** (London) was indeed "a weird-looking specimen of the human race," as the

author phrases it. The least pressure upon the frog-like eyes was sufficient to dislocate the globes. The palate was very high and the arch narrow. The left optic disc was smoky colour, with a pale centre situated in an excentric position. The right optic disc was of a light smoky colour, with a central pale area. The retinal veins were large and the arteries small. Carpenter's patient (a child aged five weeks) presented many other malformations, such as webbed

fingers and toes, supernumerary toes, hernia, and so forth. It is interesting to note that several years ago Carpenter had under his care two sisters of the present patient, both of whom were oxycephalic, and presented, besides, other malformations. The family includes two other children whose appearance is normal. But a dead child, born at the seventh month, is stated to have been oxycephalic. Cases of oxycephaly published by Power, Stephenson, and Uhthoff are mentioned by Carpenter. It should be added, finally, that Carpenter's patient died shortly after it was presented to the Royal Society of Medicine.

SYDNEY STEPHENSON.

(2) The interesting specimens shown by **Carpenter** (London) were from the child whose case is described above (see No. 1). The head had been split vertically in the mid-line. A side view showed that the skull was compressed antero-posteriorly: the occipital bone was dented, while the frontal bone was flattened and thrust backwards. The parietals were narrowed at the vertex and the skull was carried upwards in the shape of a truncated cone. The orbits, elongated in the vertical diameter, were very shallow. Their margins were egg-shaped, set obliquely, and their long diameters, if projected upwards, would meet at a point in the middle line one inch above their superior margins. The condition of the brain was most peculiar. It was, in fact, bent

upon itself, so that the frontal and occipital lobes were only about one and a half inches apart, the cerebrum being curled in the shape of a loop and fitting into the distorted skull. The spinal cord showed an extra-dural hæmorrhage.

SYDNEY STEPHENSON.

(3) **Fletcher** (London) gives details of four cases of oxycephaly observed in patients whose ages ranged from eleven to forty-one years. He lays stress upon the characteristics of the disease, *viz.*, the cranium of abnormal shape,

the exophthalmia, the impairment of sight as the result of optic atrophy, and the malformation of the superior maxilla. Fletcher's most pronounced case is shown in the figure.*

(4) The patient described by **Stephenson** (London) was aged 32 days when first seen. The baby entered the world with the right eyeball protruded from between the eyelids. The right eye became dislocated under very slight provocation, as when the baby screamed. No family history of importance. The skull was typical of oxycephaly, and the cranium was obviously deficient as regards total size and capacity. All the bones appeared to be present, the anterior fontanelle was patent and normal in position, and the accessible sutures, such as the frontal, sagittal, lambdoidal, and coronal, were present. The eyeballs were prominent. The right eyeball became luxated forward, so that the equator lay anterior to the lids, whenever the baby screamed, and it was then slowly retracted into the orbit, presumably by the extrinsic muscles of the eye. Both cornea were of elliptical outline. The right cornea showed a perforated ulcer towards its centre. The superior maxilla was ill-formed, as

*By a curious coincidence, this patient was exhibited by Sydney Stephenson at 17 years of age, and the case, together with photographs, was published in the *British Journal of Children's Diseases* in 1905. Dr. Morley Fletcher was apparently ignorant of this fact when he presented the patient to the Royal Society of Medicine.

shown by the condition of the arch of the palate. The baby died from asthenia a few weeks after he was shown at the Royal Society of Medicine at the age of 86 days.* SYDNEY STEPHENSON.

VI—LANDRY'S PARALYSIS.

Cowan, John, Ballantyne, A. J., and Macdonald, W.—A case of Landry's paralysis. *Glasgow Medical Journal*, February, 1909.

Cowan, Ballantyne, and **Macdonald's** (Glasgow) case of Landry's paralysis has been diagnosed carefully from acute poliomyelitis and acute polyneuritis. All writers on this disease agree that involvement of the cranial nerves, and especially of those related to the eye, is rare. In the present case, not only were there defects of eye movements, but a visual defect as well. Yet sensory defects of any kind are rare in Landry's paralysis. The patient was a dress-maker, aged 33. Her motor eye symptoms were attributable to a lesion of the third nerve nucleus. The Argyll Robertson phenomenon was present and persisted in spite of the patient's general recovery. This persistence the authors regard as suggestive of a specific element. The visual defect (V.R. = $\frac{5}{60}$, V.L. = $\frac{5}{12}$, relative pallor of right disc) rapidly improved *pari passu* with the other eye symptoms and finally became $\frac{5}{5}$ in each eye. The fields, when the patient was well enough to have them roughly observed, showed some constriction of the right as compared with the left, no sector or hemiopic defect being discovered. No central scotoma. The authors say, "the nature of the visual defect limits us to a lesion in front of the chiasma, and if we assume that the disease results from an intoxication of ganglion cells, the cause of the amblyopia in this case is probably to be looked for in the retina itself."

ERNEST THOMSON.

VII.—AMAUROTIC FAMILY IDIOCY.

(1) **Poynton, F. J.—Amaurotic family idiocy.** *Proceedings Royal Society of Medicine*, March, 1909.

(2) **Verhoeff, F. H.—Amaurotic family idiocy: histological examination of a case in which the eyes were removed immediately after death.** *Archiv. of Ophthalmology*, March, 1909.

(3) **Poynton, F. J.—On amaurotic family idiocy.** *British Medical Journal*, May 8th, 1909.

(1) **Poynton** (London) reports a typical instance of Tay-Sachs' disease in a Hebrew child of eight months whose sister had died from a similar affection at the age of two years and four months. The patient was breast-fed.

SYDNEY STEPHENSON.

(2) The only pathological changes found in the eyes by **Verhoeff** were degeneration of all the retinal ganglion cells, especially those in the macula,

*At the autopsy, brain normal as regards shape and coarser structure, all bones and sutures present. Orbital cavities of roughly triangular shape. Depth of orbit, from optic foramen to margin of orbit all round, about one inch.

and degeneration of the optic nerve, which was complete in the temporal portion. There was no hole in the macula, the dark spot seen with the ophthalmoscope being due to contrast, since it disappeared when a piece of white paper was placed behind it. There was no gliosis of the retina, and no degeneration of the rods and cones or undue tendency of this layer to adhere to the pigment epithelium. No œdema of the macula was found. Similar changes were found in the brain cortex. The optic nerve entrance presented the appearance characteristic of myopia, although the eyes were not myopic, showing that this condition is not necessarily the result of myopia but may be inherited along with a tendency to myopia. ROSA FORD.

(3) **Poynton,** of London, deals with that rare disease amaurotic family idiocy, the ophthalmoscopic symptoms of which were first described in the year 1881 by an English ophthalmic surgeon, Waren Tay. The four cases seen by Poynton during recent years were all sent to hospital as instances of rickets, on account of the loss of power and general feebleness. The parents in each case were Jews, not related by ties of blood. The family tendency of this slowly progressive disease was shown in Poynton's first case. The ocular signs of amaurotic family idiocy, according to the author, include primary optic atrophy, dilated and inactive pupils, together with the characteristic ophthalmoscopic appearance of the macular region. Pathologically, there is primarily a disease of the interfibrillar protoplasms of the cells, the changes in the neurofibrils being secondary. The cell destruction, which may be extensive, is of a non-inflammatory nature. The tough consistence of the brain, observed in some of the cases, results from a secondary proliferation of the neuroglia. The changes are not the outcome of inherited syphilis. As to the fundus changes, there is profound disease of the ganglion cells of the retina, and at the fovea there may be atrophy, or even possibly destruction, of the retina. The retina around the fovea may be swollen. Optic atrophy is due to extensive disease of nerve-cells and nerve-fibres. Treatment appears to be useless. Poynton would not even follow the suggestion made by Hirsch, namely, that the mother of an affected infant should not nurse any child she might bear in the future. SYDNEY STEPHENSON.

VIII.—MIGRAINE.

Gowers, Sir William R.—An Address on the Prodromas of Migraine. *British Medical Journal*, June 12th, 1909.

This interesting address by **Gowers** (London), describes those functional disturbances in the sensory region that usher in attacks of migraine (or paroxysmal headache) and discusses other points connected with the affection in question.

The prodromata of migraine are restricted in range, and involve the sense of sight and of touch ; but other special senses, as smell, taste, or hearing, do not participate. Slight vertigo, however, may occur, but rarely. The most common premonition is an interference with sight, taking the form of hemianopsia, which does not actually reach the middle line, and which is seldom, if ever, so complete as it is from organic disease. The loss on one side is often associated with a luminous spectrum, a typical form of which was described by Dr. Airy in a famous communication to the *Philosophical Transactions.* Gowers describes the appearance in the following words:

"This begins as a star, a little to one side of the fixing point, which enlarges, becoming first an angled sphere and then a serrated or zigzag outline which breaks below, and the elements of which it consists become progressively smaller towards the free extremity. They are often coloured, adjacent ones differing. Sometimes they are luminous without colour. Often they are double. Within the zigzag, as it expands, there is a misty luminosity which becomes fainter internally, and hinders sight if an object is looked at. Thus the dimness of vision within the bright or coloured zigzag outline resembles the numbness left by the tingling as it passes up the arm. After its expansion the spectrum often ends by a whirling explosive appearance. In other cases an angled light appears near one lateral edge of ths field, or both, sometimes several interlacing zigzags. Or a stellate bright object may appear on one side and remain, without expanding. In other cases a sort of luminous lace-work occupies the middle of the field, sometimes bounded by a brighter band."

Transverse hemianopia may now and then be observed before an attack of migraine. It may, as in a case mentioned by Gowers, alternate with lateral hemianopia.

As to cutaneous sensibility, the arm is the most frequent seat of this manifestation. The sensation is not one of actual pain, but is best, perhaps, described as one of tingling or of "pins and needles." It may be felt in the tips of the fingers or as a zone of tingling around the wrist. It leaves behind it lessened sensibility, together with some loss of power, the result apparently of inhibition. Aphasia—or, at least, a difficulty in speech—is another frequent warning of migraine, when the sensory disturbance is right-sided.

These prodromata are difficult of explanation, but it is probable that the cause is to be found in a local vaso-motor spasm causing anæmia in certain parts of the cerebral hemisphere (cortex), and that subsequent dilatation of the arteries accounts for the pain.

Gowers regards it as certain that sufferers from migraine often inherit a pronounced gouty tendency. Migraine may commence at any period of life, and it is interesting to note that when beginning in adults, the prodroma may occur alone (at least, sometimes), the headache being or becoming slight and trifling. When a visual spectrum has frequently ushered in the headache, it is sometimes called into separate existence, without succeeding headache, by any flickering before the eyes. Thus, a surgeon who had suffered from migraine for many years, sometimes set up his customary spectrum by reflection from the blade with which he was operating.

Migraine and epilepsy occasionally co-exist in one and the same patient, and usually whichever disease existed first presents a diminution after the second has developed. The two affections, nevertheless, seem to be essentially independent. Gowers has only once or twice met with a true connection between them, the visual premonition of migraine becoming quickened into the aura of the epileptic fits. Such a relation is, however, extremely uncommon.

As regards treatment, Gowers has seen much benefit follow the administration of nitroglycerine and strychnine. If that fail, bromide taken regularly may have a good effect, or a small long-continued course of salicylate may succeed. A developing attack may be cut short by antipyrin, migrainin (Hochst), or migralgin (Martindale). It is well to bear in mind that dyspepsia is common in some of the patients who suffer from migraine, and that an error in diet may cause an attack some time after the former one.

SYDNEY STEPHENSON.

IX.—SOME LATE COMPLICATIONS OF PENETRATING WOUNDS OF THE CORNEA.

Morax and Duveger.—On the nature and symptoms of certain late complications of penetrating wounds of the cornea. Epithelial invasion of the walls of the anterior chamber. (Nature et symptomatologie de certaines complications éloignées des plaies pénétrantes de la cornée. L'invasion epithéliale des parois de la chambre antérieure.) *Ann. d'Oculistique*, T. CXLI, p. 1, janvier, 1909.

Morax (Paris) and **Duveger** (Paris) give detailed histories of two cases of epithelial invasion of the anterior chamber following penetrating wounds, and endeavour to describe the essential symptoms of the condition.

The first patient, a young girl, met with a penetrating scissors wound of the cornea, accompanied by prolapse of the iris. The prolapsed iris was removed, and the eye healed well and became perfectly quiet, but a year later shewed symptoms of irritation, and subsequently developed cysts of the iris with increased tension, on account of which it was enucleated. On pathological examination, it was found that the anterior corneal epithelium had penetrated through the corneal wound, lined the walls of the anterior chamber, in which it formed cysts, and caused dislocation of the lens forwards with rupture of its capsule, finally giving rise to complete suppression of the paths of excretion of the aqueous humour. The ciliary processes and posterior parts of the eyeball were quite normal.

The second patient, a woman aged 27, had an operation for congenital cataract when 18 years old, which left the eye free from pain or inflammation but without any improvement in vision. After an interval of seven years, the eye became subject to attacks of irritation, and one year later a white spot was noticed over the operation scar. This spot rapidly increased in size for two months, after which it remained stationary, but the eye remained subject to attacks of irritation with peri-ocular pain. When seen by Morax in September, 1900, there was a prominence of the left eye resembling at first sight a corneal staphyloma, which, on closer examination was found to be a voluminous cyst, crescentic in shape, surrounding the cornea on the upper outer and lower sides, and covering only 2 or 3 mm. of the clear cornea, but extending so far back on the temporal side of the eye that its limit could not be reached. The tension of the eye was slightly subnormal, and pressure on the cyst caused some pain. The cyst was tapped and about 2 c.m. of non-albuminous transparent fluid containing scarcely any cellular elements were withdrawn from it. As the cyst rapidly refilled, the anterior segment of the eye, including the ciliary body, was removed on September 12th, 1900. The operation was quite successful, the patient getting an excellent stump and in 1908 the result was still satisfactory. Pathological examination of the portion of the eye which had been removed showed that the anterior chamber had been transformed into an epithelial cyst, separated completely from the other parts of the globe but communicating by a large opening with a pre-corneal cyst.

From a study of these cases the authors draw the following conclusions :—

1. As Fuchs has stated, the late complication of traumatic or operative penetrating wounds of the cornea, which is anatomically characterised by penetration of corneal epithelium through the wound into the anterior chamber, can at the beginning cause no objective symptom.

2. Irritative symptoms, photophobia, and lacrymation, with episcleral injection, frequently accompany the development of this epithelial penetration, and are not necessarily associated with increased tension, which can occur as a secondary complication.

3. These irritative symptoms with or without obvious lesions in the anterior chamber (cysts of the iris) must not be confounded with the irritative symptoms associated with sympathetic iritis or irido-cyclitis, from which they are distinguished by the absence of inflammatory symptoms in the iris and at the posterior surface of the cornea, and by the long period (8 to 12 months) which elapses between the traumatism and the onset of the troubles.

4. When the diagnosis of epithelial invasion has been established, removal of the anterior segment of the eyeball, including the ciliary body, is indicated, as it gives a better stump than enucleation, and is, in their opinion, free from the risk of causing sympathetic inflammation, as the posterior parts of the eye are healthy. R. J. COULTER.

X.—LUMBAR PUNCTURE IN SOME CASES OF AMBLYOPIA.

Ravaut, P., Gastinel, P., and Velter, E.—On the effect of lumbar puncture upon certain amblyopias. (De l'effet de la ponction lombaire sur certaines amblyopies.) *Gazette des Hôpitaux*, 1909, p. 903.

Ravaut, Gastinel, and **Velter** (Paris) have a communication dealing with the effect of lumbar puncture in certain cases of amblyopia, especially with those associated with recurrent dermatoses. They report five cases (briefly resumed below), but it is a pity that, from an ophthalmic point of view, the facts are somewhat sketchy.

1.—A female, aged 40 years, had suffered a couple of years before coming under notice from a melanotic growth of one axilla, and for several months there had beeh a generalisation of the melanosis. For two months before she was seen by the authors there had been atrocious headaches, together with a slow but progressive deterioration of sight. V.==0.4. Bilateral choked disc. Ten days later sight was scarcely equal to the counting of fingers. By lumbar puncture 7 c.c. of fluid were withdrawn, and during escape of the liquid, the patient found that her sight had become so much better that she could recognize clearly the features of those who stood around her bed. The improvement as regards the headache lasted forty-eight hours ; but the sight fell away little by little during the next few days. On the third day after the puncture, no alteration could be made out in the condition of the fundus oculi. The patient died fourteen days after the little operation, and at the autopsy a melanotic growth was found in each occipital lobe, along with a similar deposit in the right frontal lobe.

2.—A woman who had been affected for six years with relapsing and tenacious urticaria, presented also bilateral irido-choroiditis. The left eye, moreover, had been operated on for cataract, and iridectomy had been performed upon the other eye on account of glaucoma V. = scarcely p.l. When admitted, even p.l. had been lost. Lumbar puncture, with the withdrawal of 8 c.c. of cerebro-spinal fluid, caused an improvement in sight lasting for several hours, and a disappearance of the prurigo. After some time, however, prurigo returned and sight again fell. A second and third lumbar puncture led to similar results as regards both the urticaria and the vision.

3.—A man of 58 years had suffered for long from successive attacks of weeping eczema of the face and hands. He complained also of headache and of his sight, although no objective lesions of the fundus oculi could be made out. Arterial tension = 18 (Potain). By lumbar puncture 12 c.c. of fluid were removed, and a couple of days after the operation, pruritus had disappeared and the man could read a newspaper, a thing he had been unable to do for some time. When he left hospital, ten days after puncture, his sight had greatly improved, the pruritus had completely disappeared, and the cutaneous lesions were healed.

4.— A female, aged 70 years, entered hospital on account of a chronic eczema of the hands and other parts. Arteries hard : tension = 22 (Potain). She complained of *mouches volantes*. V. = fingers. Small lental opacities. T.n. Visual field normal. No lesion could be found in the fundus oculi. On the day following the withdrawal of 12 c.c. of cerebro-spinal fluid the pruritus was better, the *mouches volantes* had disappeared, and sight was considerably improved. On the next day the woman could see well enough to do embroidery work. Arterial tension=20—21 (Potain). Sight failed somewhat 13 days after operation.

5.—A woman, aged 64 years, was affected with a weeping and pruriginous eczema, together with *mouches volantes* and failure of sight. For several months she had been unable to sew. The removal of 12 c.c. of cerebro-spinal fluid was followed by immediate improvement in sight. When the patient was discharged 32 days after operation, she was able to do fine embroidery. A relapse occurred some five months later. When read nitted to hospital, about a couple of months after that, weeping eczema was present, while the intraocular tension was slightly raised, and there was some congestion of the optic papilla and retina. R.V.=0.1 L.V.=0.2. A couple of days after lumbar puncture had been performed, R.V.=0.4, and L.V.=0.2, and with *plus* 3 D. (the patient being presbyopic) V.=0.5. There was no change in the condition of the fundi, but the intraocular tension was reduced. Arterial tension=16—16½ (Potain). The last note was made about a month after the second lumbar puncture, when R.V.=0.7 and L.V.=1, and the fundi showed distinct improvement.

SYDNEY STEPHENSON.

XI.—THE PEDIGREE OF EYE DISEASE.

(1) **Harman, N. Bishop.—Congenital cataract ; a pedigree of five generations.** *Trans. Ophthalmological Society* U.K., Vol. XXIX, Fasc. 2, 1909, p. 101.

(2) **Cunningham, J. F.—A case of Aniridia, with a family history of the condition in four generations.** *Ibidem*, p. 131.

(3) **Nettleship, E.—Seven new pedigrees of hereditary cataract.** *Ibidem*, p. 188.

XII.—THE SPONTANEOUS CURE OF CORNEAL ASTIGMATISM.

Lagrange, Félix.—On the spontaneous cure of hypermetropic corneal astigmatism. (De la guérison spontanée de l'astigmie cornéenne hypermetropique.) *Archives d'Ophtalmologie*, juillet, 1909.

The observations of Bull, Javal, Martin, Risley, Pfalz, Aubigné-Carhart, Steiger, Zapatero, Sonder, and Lagrange show that corneal astigmatism is not invariable. As age advances, direct tends to pass into inverse corneal astigmatism.

The recent researches carried out by **Lagrange**, of Bordeaux, are of considerable practical importance, since they go to show that optical correction of corneal astigmatism in young subjects is inimical to the spontaneous cure of the error. His eighteen cases may be divided into three groups : 1. where glasses have been worn constantly ; 2. where glasses have been worn intermittently ; and 3. where no glasses have been worn. The first group includes 6 cases, the second 3 cases, and the third 8 cases. Broadly speaking, the astigmatism remained without change in the first group ; it underwent trivial changes in the second ; and in the third it tended towards cure The conclusion is, that the correction by glasses of juvenile hyperm etropic astigmatism tends to interfere with spontaneous cure. Many authors, among them Javal and Steiger, have advised against anything like the full correction of hypermetropic astigmatism (regular) in children, but Lagrange believes that the recommendation is more honoured in the breach than the observance. His explicit recommendation, therefore, is that hypermetropic astigmatism in children below fifteen years of age should not be corrected by glasses unless discomfort, manifestly due to the astigmatism, is present.

When the astigmatism amounts to less than 2 D., cure may always be expected, and in such cases co-existing hypermetropia should alone be corrected. If symptoms persist after a spherical glass has been worn, the cylindrical element may be added. The mechanism of spontaneous cure, as taught by Martin, of Bordeaux, lies in partial contraction of the ciliary muscle. In young subject affected with direct hypermetropic astigmatism, the muscle pulls energetically on the two extremities of the horizontal meridan of the cornea, and in that way insensibly augments the curvature of the cornea.

In sum, then, Lagrange recommends that in children we should not correct hypermetropic astigmatism except in presence of symptoms produced by the error of refraction, when a convex spherical glass should always be tried first. A moderate cylindrical correction should be added only if the spherical correction fail to relieve symptoms. SYDNEY STEPHENSON.

XIII.—ACCOMMODATION AT VARIOUS AGES.

Duane, Alexander. — An attempt to determine the normal range of accommodation at various ages, being a revision of Donders' experiments. *Trans American Ophthalmological Society*, Vol. XI, part III, 1908.

This important communication by **Duane**, of New York City, deserves to be studied by every ophthalmic surgeon.

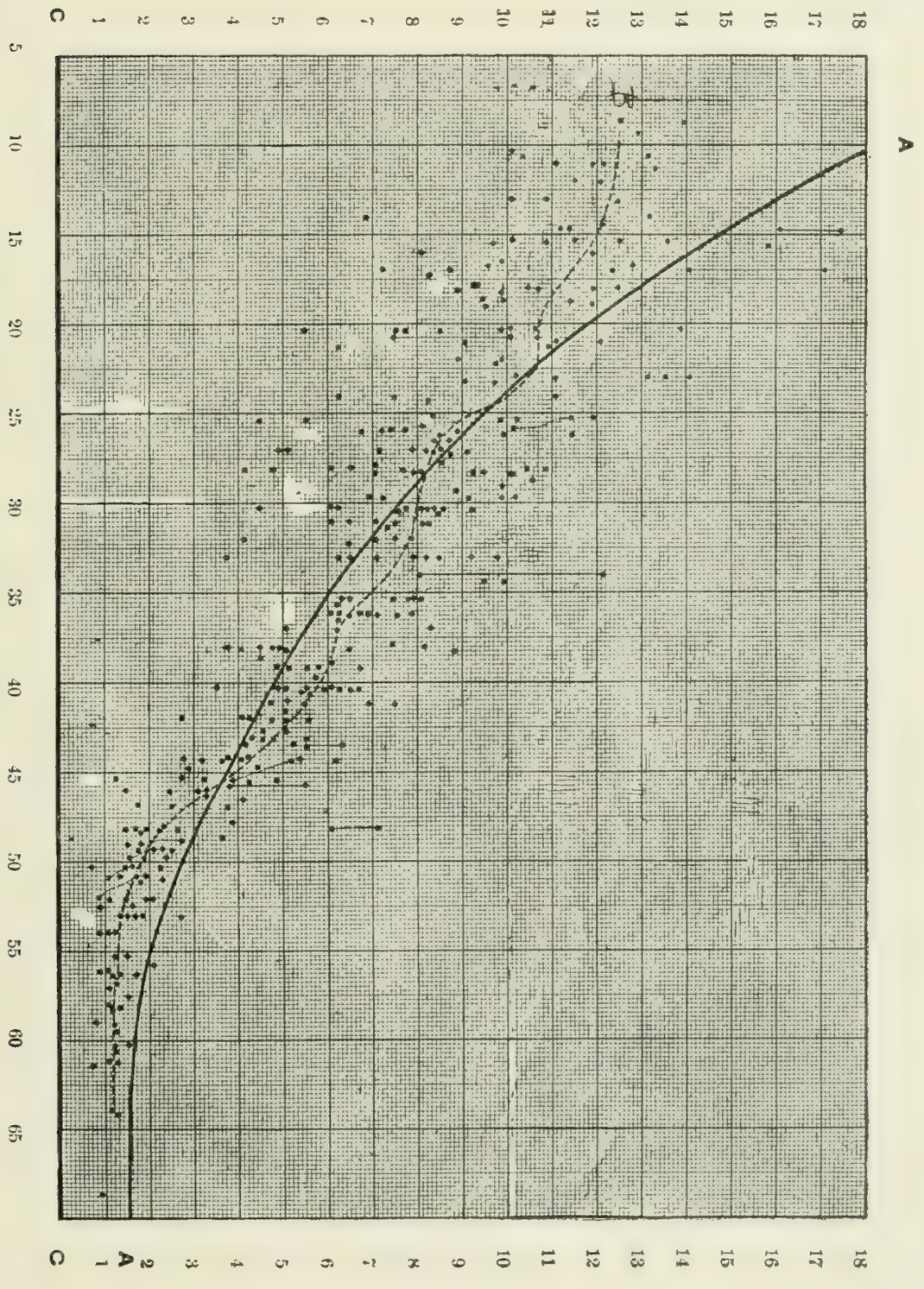
Donders' well-known figures dealing with accommodation, which are to be found in every text-book of ophthalmology, were based upon the examination of the near-point in about 100 subjects. As pointed out by Duane, they are not altogether free from fallacies, of which one of the most serious is that Donders assumed emmetropia in the absence of cycloplegic tests. As practical surgeons, we need to know the absolute range of accommodation at each age and the limits within which this range may vary. Duane's experiments (in which he was assisted by J. B. Thomas) were made under such conditions as rendered unlikely any important error. Each patient was rendered absolutely emmetropic by glasses* ; and with this correction, his near-point was repeatedly ascertained, under conditions of careful illumination, by means of a simple engraved line, 0.2 mm. thick by 3 mm. long.† The near-point was invariably measured from the anterior focus of the eye—*i.e.*, from a point 13 mm. in front of the cornea. The method and the nature of the test object were uniform in all the observations carried out. In this way Duane examined nearly 400 cases—that is to say, about three times the number dealt with by Donders. The values thus obtained for the range were then plotted upon a diagram, similar to that employed by Donders (*see* figure). The line CC, which denotes the far-point at different ages, coincides everywhere with the base or zero line, instead of falling below the last-named at the age of 45 years. After the age of 50 years the line AA, which denotes the near point, instead of approaching the base line, is almost parallel.

*A cycloplegic was used in all patients under 48, and in some over that age. Care was taken to determine the astigmatism accurately to within 0.25 or even 0.12 D.

†The little apparatus, which can be obtained from Gall and Zembke, 1, West 42nd Street, New York, is fully described in the *Ophthalmic Record* of July, 1909.

The average, minimum, and mean ranges, as determined by Duane, were as follows :

Age.	Range. Mean.	Low.	High.	Donders' Average.
10	14.0	10.0	16.5	18·0
15	13.0	9.7	16.0	15.0
20	13 7	7·5	14.0	11.8
25	9.6	8.2	12.0	9.7
30	8.8	6.3	10.4	7.8
35	7.0	6.5	8.0	6·0
40	5.9	4.9	6.7	4·8
45	3.8	1·3	5.0	3·7
50	1.8	0.7	2.3	2.6
55	1.3	1.2	2.0	2.0
60	1·2	1.2	1.5	1.5



Among the more important tentative conclusions reached by Duane as the result of his investigations may be mentioned the following: (1) The absolute range of accommodation, and consequently the shape of the presbyopic curve, differ somewhat (see lines AA and BB in the figure) from those obtained by Donders. (2) Accommodation does not decrease year after year by any steady sweep, but at some periods of life seems to remain about the same for years together, and then to descend rapidly. (3) A decided and rather abrupt plunge begins at the age of 40, and continues without interruption to the age 51‡; while after 51 the accommodation remains nearly constant, diminishing not more than 0.50 D in ten years. (4) Owing to the variation shown by the same patient from time to time, a single determination of the power of accommodation has little value. (5) Cases where the maximum accommodation power of one eye was persistently higher than that of its fellow were not very uncommon. (6) Corrected myopes frequently showed a surprisingly high power of accommodation. SYDNEY STEPHENSON.

XIV.—THE NOTATION OF ASTIGMATISM.

(1) **Oppenheimer, E. H.—The question of the notation for the axes of cylinders.** *Wochenschrift für Therapie und Hygiene des Auges*, März 4, 1909.

(2) **Percival, Archibald Stanley.—The notation of the axis of astigmatism and of perimetric charts.** *XI Congresso Internazionale di Oftalmologia*, Fascicolo primo, p. 58, Aprile 2-7, 1909.

(3) **Jessop, W. H. H.—International notation.** *British Medical Journal*, June 19th, 1909, p. 1, 482.

(4) **Grossmann, Karl.—International notation of astigmatism.** *British Medical Journal*, June 26th, 1909, p. 1, 573.

(5) **Claiborne, J. H.— A chart for the axis of astigmatic glasses.** *Annals of Ophthalmology*, July, 1909.

(6) **Morax, V.— Propositions as to the practical adoption of the decisions of the XI International Congress of Ophthalmology relative to the notation of astigmatism.** (Propositions relatives a l'adoption pratique des décisions du XIe Congrès International d'Ophtalmologie, relatives à la notation de l'astigmatisme.) *Recueil d'Ophtalmologie*, juillet, 1909, p. 86.

(1) **Oppenheimer** (Berlin) adopts the following three postulates for any system of notation of the cylinder axis: it must be (1) easily understood; (2) suitable for rapid working; and (3) acceptable, *i.e.*, not so much deviating from the known as that it is recognised by the majority of oculists. By these axioms all methods are excluded, but three in which degrees are employed, with zero either to the right or to the left or in the mid-line. The last-named system has the unimportant advantage of the same numbers when the axes are symmetrical, but absolute symmetry is not the rule, and it has just been adopted

‡The accommodation during these eleven years falls from 5.9 to 1.50 D. (a drop of 4.4 D.), while in the preceding eleven years it falls 3.4 D.

by the XIth International Congress of Ophthalmology* and thus satisfies the third postulate.

While recognising that uniformity is highly desirable, one must acknowledge, nevertheless, that improvements would rarely come if they had to wait for the majority. Oppenheimer, who was writing prior to the Congress, has discarded the symmetrical system in favour of that with the zero always at the right, as in the "standard notation" of mathematicians, partly for that reason and partly because it is widely adopted in Britain and America. It is of the utmost importance that ophthalmology should not run counter to the conventions of higher mathematics, any more than to the general principles of optics, medicine, or surgery. W. B. INGLIS POLLOCK.

(2) **Percival** (Newcastle-on-Tyne) advocates a standardization of the axes of astigmatism, so that a prescription for glasses given in one country may be made up in any other country without mistake. All over the world mathematicians have agreed to name positive anglese those described to a radius sector which starting from the horizontal position rotate counter-clockwise towards the vertical position. This notation, as he points out, is intimately connected with the universal convention that lines measured from left to right are positive, and those measured from right to left negative. Percival urges that the axis of cylinders be named in the same way for each eye—that is to say, that an angle of 30 degrees means an angle of 30 degrees measured counter-clockwise, and that an angle of 100 degrees means anangle of 100 degrees to the horizontal line measured counter-clockwise. The same principal should be applied to perimetric charts. SYDNEY STEPHENSON.

(3) At a meeting of the Ophthalmological Society, held on June 10th, 1909, **Jessop** (London) presented the report of the International Committee on the Unification of the Notation of Visual Acuity and of the Meridians of Astigmatism. The following were the conclusions: (1) The meridans of astigmatism should be measured and represented as the observer looked at the patient; (2) the axes should be measured and represented in the lower semicircle of the trial frame. The numbering of the axes should start from the middle line of the face in each eye, and proceed downwards and temporalwards. The zero would therefore lie at the nasal end of the semicircle, and 180° at the temporal end; 90° would be below and midway between these points. The Committee also agreed that for international test type numbers should be used. Landolt's ring was also thought to be a suitable object. The unit of measure was an angle of 1 minute, and the figures were to be constructed on this unit. The types were to be constructed as regards size on arithmetical progression, and the standard distance at which they were to be seen should be 5 metres. The source of light was to be diffuse daylight, if possible, opposite the types, and not laterally. SYDNEY STEPHENSON.

(4) **Grossmann** (Liverpool) characterises Jessop's account, given above, as misleading. The decision adopted almost unanimously by the International Ophthalmological Congress at Naples was: that the axes should be measured and represented in the *upper* semicircle of the trial frame, that the numbering of the axes should start from the middle line of the face in each eye and proceed upwards and temporalwards, and that the zero would therefore be at the nasal end, 180° at the temporal end, and 90° *above* and midway between these points. SYDNEY STEPHENSON.

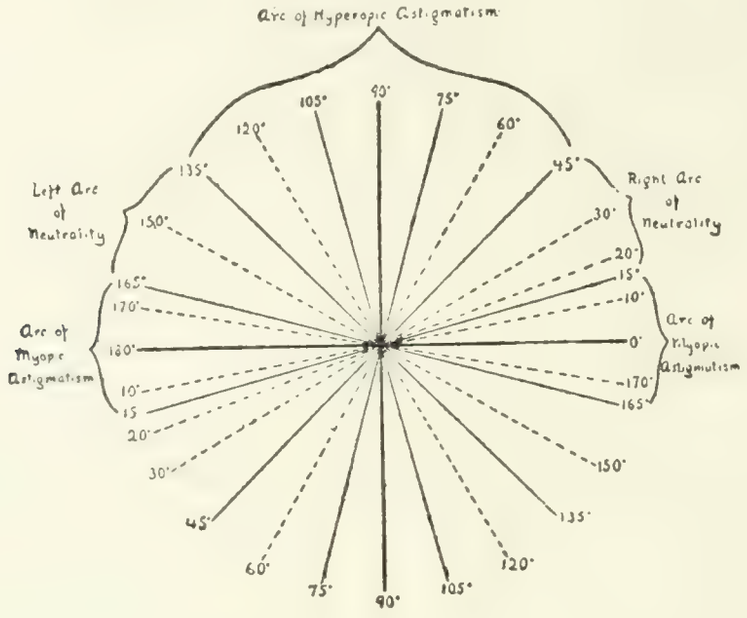
(5) **Claiborne** in an interesting communication refers to some views expressed by himself in 1892 (*New York Medical Journal*, June and July, 1892) in connection with the axis of astigmatism, namely—

1. That the axis of astigmatism does not occur at haphazard.

*THE OPHTHALMOSCOPE, 1909, page 380.

2. That there is a regularity in its occurrence in a given eye.
3. There is a certain definite relationship between the axis of both eyes when each happens to be astigmatic. The correctness of these views was shewn by the writer in a series of 1176 cases of astigmatism (*Section of Ophthalmology American Med. Assoc.*, 1904).

Clairborne has constructed a chart to represent his conclusions in a schematic form, and thereon is shown that—



A. Hypermetropic astigmatism occupies an arc of 90° and clusters around the vertical meridian. The axes of peculiar preference are at 90°, 105°, 135°, 75°, and 45°, and two secondary axes at 60° and 120°.

B. Myopic astigmatism occupies an arc of 30 degrees in the horizontal meridian. The axis of peculiar preference is at 180° or 0°, and the secondary axes lie at angles of 165° and 15°, 170° and 10° being very exceptional. In between A and B there is

C. An arc of mentiality (right and left) each of 30 degrees.

(a) Right arc.

30° occurs twice as frequently in hypermetropia as myopia while 20° occurs alone in myopia.

(b) Left arc.

Here there is one axis, viz., 150° and this occurs with equal frequency in hypermetropia and myopia.

It will be seen that, with few exceptions (between 30° and 20°, 20° and 15°, 15° and 10°, 10° 0°, 0° and 170°, 170° and 165°) the arc of 15° is the common factor of all the arcs, and that the angles at which the astigmatic glass lies vary in multiples of that number:

"It is not unreasonable, therefore, that the law of multiples should govern the position of the axis of astigmatism, since astigmatism is a change from the normal spherical eye, being in the case of myopic astigmatism or over development, and in the case of hypermetropic astigmatism an undevelopment or a retrogression."

The conclusions drawn from a study of this subject may be stated thus:

1. The angles formed by the axis of astigmatism are measured in arcs of a circle.
2. The law of multiples governs the magnitude of these angles and arcs.
3. The arc of 15 degrees is the common factor of arcs, and the angles vary in multiples of this number.

J. WHARTON.

(6) At a meeting of the Paris Ophthalmological Society, held on July 6th, 1909, **Morax** (Paris) discussed the propositions as to the notation of astigmatism adopted by the XI International Congress of Ophthalmology.* The unification then recommended was all to the advantage of junior *confrères*, and of those who make glasses. He pointed out, however, that an understanding was necessary between the two classes. At the same time he felt that such ophthalmic surgeons as have been in the habit of employing one notation, even should it differ from the one recommended by the Congress, are not likely to forsake it. Pending the universal adoption of the scheme recommended by the Congress, Morax lays down two rules.—1. That all indications given by figures without being accompanied by an explanatory diagram should be interpreted by the optician in the sense of the Congress. For example, 90° + 2D. 60° + 3D. should read : right eye, a glass of + 2D. with its axis 90° (vertical). Left eye, a glass of + 3D. with its axis 60° above (zero-nasal) 2. That unless by special request, trial lenses and other apparatus intended to measure astigmatism should be graduated in accordance with the notation of the Congress. Finally, as regards ophthalmometers, the disc recording the reading of the meredian observed should bear a double series of figures, red for the right eye and black for the left eye. SYDNEY STEPHENSON.

XV.—DECIMAL OPTOMETRIC SCALE.

(1) **Présas.—A modification of the decimal optometric scale presented to the International Congress at Madrid in 1903. (Modification à l'échelle optometrique décimale présentée au Congrès internationale de Madrid de 1903.)** *Ann. d'Oculistique*, T. CXL, p. 264, octobre, 1908.

(2) **Sulzer, D. E.—Remarks on the proposals of M. Présas. (Remarques concernant les propositions de M. Présas.)** *Ann. d'Oculistique*, T. CXL, p. 275, octobre, 1908.

(1) **Présas** (Barcelona) urges that with a view to obtaining a uniform standard for measuring visual acuity, the grade (the one hundredth part of the quarter of a circle) which is big enough to measure the different degrees of such visual acuity should be adopted as the angular unit, and that arithmetical progression by distance in accordance with the formula $V = \frac{d}{D}$ should be the only one recognised in the construction of optotypes. He recommends instead of letters white crosses on a black ground for near vision, and black, red, and green crosses on a neutral grey background for distance.

(2) **D. E. Sulzer** briefly describes the principle of the somewhat similar proposals laid before the International Congress of Ophthalmology at Lucerne in 1904 by A. Sulzer, and points out that Présas in his article quotes a scale which was merely put forward as an example but never adopted. R. J. COULTER.

*Readers will recollect that the Optical Society has published a valuable report on the standardisation, not only of cylindrical lenses, but of several other things besides, such as prism notation, transmission values of coloured glasses, and the measurement of the power of spherical and cylindrical lenses (THE OPHTHALMOSCOPE, 1908, p. 686). The angle notation for cylindrical lenses recommended by the Optical Society unfortunately differs from that advised recently by the International Congress of Ophthalmology. S. S.

XVI.—TRACHOMA.

(1) **Bordley.—Trachoma in the American Negro Race.** *Bulletin Johns Hopkins Hospital*, February, 1907.

(2) **Chavez.—Trachoma in Mexico.** *Anales de Oftalmologia*, March, 1907.

(3) **Troncoso, Uribe Y.—Trachoma in Mexico and its diagnosis.** *Ibidem*, August, 1907.

(4) **Egan, W. L.—Trachoma.** *New Orleans Medical and Surgical Journal*, May, 1908.

(5) **Truc, H. and Peretz, H.—Histological examination of the orbital lacrymal gland in a case of old trachoma.** *Rev. Générale d'Ophtalmologie*, 30 juin, 1908.

(6) **Carhart, W. M.—Some remarks on the surgical treatment of trachoma.** *American Journal of Surgery*, June, 1908.

(7) **Pusey, Brown.—"Trachoma Bodies" possibly the ætiologic factor of trachoma.** *The Quarterly Bulletin of North-Western University Medical School*, June, 1909.

(8) **Atkinson, T.—Observations in trachoma, with report of cases.** *Journ. Ophthalmology and Oto-Laryngology*, 1909, Vol. III., p. 43.

(1) **Bordley** maintains, with many other American surgeons, that, whatever the reason may be, trachoma does not occur in the American negro. Forms of conjunctivitis closely resembling trachoma certainly do occur, but all reported cases lack some vital point in the diagnosis. The writer reports several cases in which he and others diagnosed trachoma but in which the result of treatment falsified the diagnosis. "I must conclude," he says, "that under certain circumstances the xerosis bacillus attacks the conjunctiva of the negro and provokes an inflammation which so closely simulates trachoma as to make it impossible in the first stages to make a certain diagnosis."

ERNEST THOMSON.

(2) **Chavez** finds that trachoma is increasing somewhat rapidly in Mexico and attributes the increase to the increasing density of the population and the number of infected immigrants; these mix freely with the natives and through lack of precautions, infect the latter. HAROLD GRIMSDALE.

(3) This is a reply to a paper by Chavez (see above), who had stated that trachoma was becoming much more frequent in Mexico, as a result of alien immigration. **Troncoso** holds that Chavez has confused follicular catarrh with true trachoma, and that there is really no increase in the frequency of the more serious disease. HAROLD GRIMSDALE.

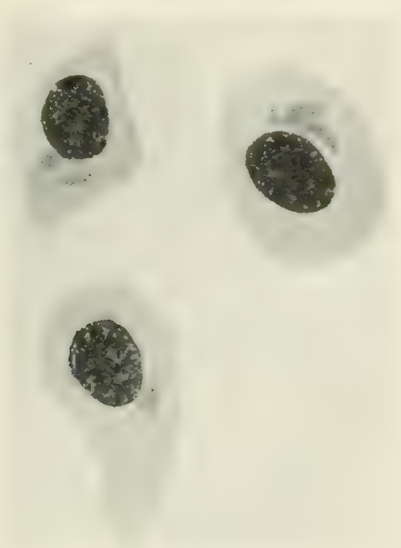
(4) **Egan** (Shrereport, Louisiana) would have us believe that trachoma is neither contagious nor epidemic. He thinks, however, that it may be epidemic where filth and squalor prevail. He tells us that the disease is nothing but a local manifestation, a "symptom," which, for cure, should be treated as such with mild caustic applications and astringents. C. A. OLIVER.

(5) In a woman of thirty-two who suffered from old-standing trachoma, blockages of the excretory channels, and facial paralysis, accompanied by uncontrollable lacrymation, **Truc** and **Peretz** (Montpellier) excised the lacrymal gland: an operation frequently done by Truc in cases of trachoma with severe lacrymation. Examination of the excised gland showed diffuse infiltration,

rich periacinous infiltration, and focal infiltration, the masses of lymphocytes being closely packed, so as to form actual granulomata. The acini themselves were invaded in several places by conjunctival tissue in the form of broad bands of scleroses running through the parenchyma in all directions, surrounding the acini, penetrating and obliterating them. The gland cells thus imprisoned were completely degenerated. The authors think it possible that the trachomatous process has extended to the lacrymal gland either along the excretory ducts or *viâ* the blood stream. ERNEST THOMSON.

(6) **Carhart's** conclusions are as follow.—1. The surgical treatment of trachoma is, in my estimation, the most effective way of combating the disease. 2. Expression is safe and effective. 3. It shortens the duration of treatment in a marked degree. 4. The operation can be performed under cocaine, but in severe cases and in intractable children ether and gas are preferable. 5. Adhesions in the lids should be separated with the probe daily until the tissues of the lids have healed. 6. The reaction caused by the operation yields readily to ice-cloths applied to the lids, and the resulting traumatic conjunctivitis can be controlled in a few days with a silver salt. 7. The after-treatment is most important to attain complete cure and to present recurrence, and should continue some weeks. ERNEST THOMSON.

(7) **Pusey** (Chicago) describes the so-called "trachoma bodies" found in quick succession by Halberstaedter and Prowazek, Greeff and Frosch, and Clausen. The findings of the authors named have been confirmed by Pusey in a case of acute trachoma occurring in a woman of about 30 years of age, in whom the condition had existed for some ten days. On the third day after the patient had come under Pusey's observation, the everted conjunctiva of the less affected eye was scraped with the edge of a cover glass, and the material thus obtained was allowed to dry in the air. The material was fixed for 20 minutes in methyl alcohol, and was then treated for 24 hours with Giemsa's stain. The



findings agreed perfectly with the description of the "bodies" as published by Halberstaedter and Prowazek. Figure 1 shows the beginning of the growth of the "bodies" in the cell, while figures 2 and 3 show later stages of development. Many attempts were made, but without success, to cultivate the "bodies." Important facts regarding the "trachoma bodies," in Pusey's opinion, are the following.—1. They can be found wherever trachoma occurs; 2. They are most readily found in acute cases, and at the beginning of the disease; 3. They cannot be demonstrated except in conjunctivæ affected

with trachoma ; and 4. They can be found not only in human trachoma, but also in the conjunctiva of apes experimentally affected with the disease.

SYDNEY STEPHENSON.

(8) Historical and geographical aspects of the question are dealt with by **Atkinson,** of Dallas, Texas. In Texas the disease is common and unusually virulent. As to treatment, every case must be dealt with according to indications presented, and the patient impressed with the gravity of the condition: with the necessity for fitting treatment and patience. Surgical treatment by "expression" rather than "grattage" or excision. Destruction of the conjunctival tissue with resulting scar is to be avoided. Blue stone as a routine application tends to the same result. Bichloride solution, 1:500, with massage of the lids, has given him good results. Silver nitrate, 2 per cent., applied to the lids three times a day, if there is much secretion; carefully washing away excess with normal saline soon controls. Argyrol and other products of silver applied vigorously. The virtue is in the massage. In the later stages boroglyceride, $33\frac{1}{3}$ per cent. solution, is regarded as a standard remedy. Two cases are reported in illustration of the subject.

HENRY L. G. LEASK.

XVII.—THE HISTOLOGY OF TRACHOMATOUS PANNUS.

(1) **Addario, C.—Histology and pathogenesis of trachomatous corneal pannus.** *Annali di Ottalmologia*, Vol. XXXVI, fasc. 12.

(2) **Meyerhof, M.—On lymphoid formations in trachomatous pannus.** *Klin. Monatsbl. f. Augenheilkunde*, Oktober, 1908.

(3) **Komoto, J.—On the histology of pannus trachomatosus.** *Ibidem*, Januar, 1909.

(1) **Addario** (Palermo) has studied very closely the structure of pannus tenuis and pannus crassus, as regards both the corneal tissues proper and the tissue of the limbus. By means of excisions of longitudinal tongues of bulbar conjunctiva between the limbus and the superior fold, the author has also studied the changes in the bulbar conjunctiva and the episclera, both in early and in old deep trachomatous pannus. The histological descriptions, which should be read in the original, complete those already given by the author on the pathological anatomy of the different forms of granular conjunctivitis.

A. ANTONELLI.

(2) Herbert has described the occurrence of follicles and peculiar pigmented depressions near the upper corneal margin in trachomatous pannus. **Meyerhof** (Cairo) has seen the same formations in about fifty per cent. of all cases of trachoma with pannus. He describes the follicles as flattened, oval nodules separated from each other by the more conspicuous corneal vessels. In rare cases, by the growth of a single follicle or the conglomeration of many, a larger area of the cornea may become involved in the shape of pannus crassus. But usually regressive changes take place in the follicles, the marginal pits mentioned above, and grooves formed by their coalescence, are looked upon by Meyerhof as the end stages in the process of resorption. (Herbert too had considered the possibility of such an origin of the marginal pits, without, however, pronouncing himself in favour of this view.—The Reviewer.)

C. MARKUS.

(3) According to the older view, the granulation tissue in trachomatous pannus is situated between the corneal epithelium and Bowman's membrane. Raehlmann and others denied this, locating it beneath Bowman's membrane. **Komoto's** findings are more in harmony with the former view. As long as Bowman's membrane is intact, the infiltration is found between it and the epithelium. Only in case of perforation of the membrane, which is not a rare occurrence, does the corneal tissue proper become invaded. The thickened epithelium was often seen by Komoto sending out papillary projections into the granulation tissue underneath. C. MARKUS.

XVIII.—TRAUMATIC OPHTHALMOPLEGIA.

Basso.—On intrinsic ophthalmoplegia of traumatic origin by contusion of the eyeball. *Annali di Ottalmologia*, Vol. XXXVI (1907), fasc. 9 to 11, p. 730 to 745.

We know how much discussion still exists about the pathogenesis of the iridoplegia and paresis of accommodation which form temporary or permanent sequelæ of certain ocular traumatisms. **Basso** (Genoa) after reporting five personal cases of this kind, and reviewing the literature, more particularly the experimental investigations of Berlin and of Denig, briefly relates his experiments on rabbits by slow and gradual, or quick and strong pressure on the cornea, the limbus, or the equator of the eyeball. The result of his experiments would seem to be that contusions of the anterior portion of the globe do not directly affect the innervation of the pupil, and that the traumatic phenomena of the iris are of vascular origin, and are manifested rather by spastic than by paralytic alterations ; also, the distortion of the eyeball by compression provokes ischemia of the retina, but does not alter the pupil at the very moment of compression, and the pupil reacts later to the traumatism by vascular and spastic alterations. Basso agrees with Ohm that the cause of intrinsic ophthalmoplegia is to be found in an indirect traumatic lesion of the posterior pole and of the optic nerve, which affects a certain number of ciliary nerves composed entirely or almost entirely of motor fibres.
A. ANTONELLI.

XIX.—REMEDIES.

(1) **Smith, Major H. (Juilundur). — The treatment of trachoma, pannus, and corneal ulcer depending on trachoma.** *A paper read before the Bombay Medical Congress*, February, 1909.

(2) **Gilbert.—The treatment of ophthalmia neonatorum by means of beef serum.** *Münchener medizinische Wochenschrift*, 1909, Nr. 30 ; ref. in *Bull. Gén. de Thérapeutique*, 8 mai, 1909.

(3) **Le Roy, Bernard R.—On the curability of cataract without interference : a clinical study.** *American Journal of Ophthalmology*, May, 1909.

(4) **Eyre, John, and Stewart, Bernard H.—The treatment of gonococcus infections by vaccines.** *Lancet*, July 10th, 1909.

(5) **Brunetière.—Acoin : its incompatibilities ; its use as an analgesic in subconjunctival and intramuscular injections.** *La Clinique Ophtalmologique*, 10 juillet, 1909.

(6) **Wood, G. G. Russ.—The treatment of some chronic inflammations of the eye.** *British Medical Journal*, July 24th, 1909.

(7) **Coover, David H.—Roentgen ray flashes or intermittent x-rays in the treatment of eye diseases, with report of cases.** *Ophthalmic Record*, July, 1909.

(8) **Fortunati.—The treatment of trachoma by radium.** *Klinisch-therapeutische Wochenschrift*, 1909, Nr. 23, and *Wochenschrift f. Ther. u. Hygiene des Auges*, August 5, 1909, S. 348.

(9) **Green, A. S.—The treatment of some chronic inflammations of the eye.** *British Medical Journal*, August 14th, 1909.

(1) **Smith's** treatment of these conditions appears somewhat heroic. He aims at rapid cure, and states that he obtains it. In trachoma, if "the condition is intense," the whole affected area is scraped with a knife, after 10 per cent. cocaine solution has been instilled. The surface is then painted with silver nitrate solution, 60 grains to the ounce, and this is neutralized "as soon as it has properly whitened the affected surface." In other cases the scraping with the knife is omitted. The application is repeated after two days. "A few such applications are enough for the worst of cases." Opium and cold or hot sponging may be prescribed for the relief of the pain caused by the treatment.

For pannus Smith invariably gives subconjunctival injections, 15 to 20 minims of 1 in 4,000 cyanide of mercury solution. The injection is made in such a way that the whole corneal margin becomes overhung with chemosed conjunctiva. At the end of a week the œdema subsides ; the pannus will have disappeared if the case has not been severe. The conjunctiva becomes fixed to the sclerotic, but this is only temporary. If the case is a bad one, a second injection is given on the sixth or seventh day, before the conjunctiva becomes fixed down. Opium is given for the relief of pain.

In the treatment of trachomatous ulcers the eye is douched with 1 in 2,000 sublimate solution from a tank giving six feet of pressure. The ulcers are then touched with silver nitrate solution, 60 grains to the ounce, and this is immediately neutralized. Smith never hesitates to divide the outer canthus to relieve blepharospasm. For various reasons which will not find common acceptance, Smith condemns the use of atropine drops ; he condemns eserine also. He gives subconjunctival injections, as above, for phlyctenular ulcers at the limbus, in addition to applications of solid silver nitrate. Is not the remedy worse than the disease? H. HERBERT.

(2) Attempts have recently been made to prevent the resorption and the proteolytic destruction of the tissues by the employment of artificial anti-ferments. With this end in view, human serum, as well as liquids obtained by puncture from the pleural aud abdominal cavities, has been utilized. Moreover, fresh beef serum has been applied in the treatment of purulent processes as a wash with encouraging results. Starting from these observations **Gilbert** has employed beef serum in the treatment of ophthalmia neonatorum. The observation of eight cases has shewn that after washing of the conjunctival sac, first freed from pus, there follows a passing exacerbation of suppuration, which lasts one or two days. A washing practised every two hours day and night succeeds in curing in the course of two or three weeks even the most

severe cases almost without having to employ the preparations of silver. When suppuration has not ceased at the end of eight to fourteen days, cure is accelerated by the application of silver nitrate, 1 per cent., the treatment by serum being meanwhile continued. The treatment by beef serum is not to be looked upon as a substitute for treatment by the salts of silver, but rather as replacing the weak antiseptic lotions employed concurrently with the silver. Beef serum keeps its virtues for at least twenty-four hours when it is chilled by ice. SYDNEY STEPHENSON.

(3) It is probably not necessary to say more about **Le Roy's** article than that he considers ammonia "to be the primary cause or exciting factor in perhaps all diseased conditions," and that he claims to cure senile cataract by the administration of sodium thiocyanate. Those who have faith in drugs for the cure of cataract may refer to the original. ERNEST THOMSON.

(4) **Eyre and Stewart** (London) in a paper of considerable interest and value, deal with fifty-three cases in which they have employed treatment by means of gonococcus vaccines. Not the least valuable part of the paper is the clear account given of the preparation and standardisation of the vaccines employed. The *technique* naturally varied according to the nature of the case, but, briefly, in septicæmic cases, the culture was made from the blood in nutrient broth, or nutrient agar, while in the urethral and other local infections the discharge was cultured on blood-agar. The organism was identified microscopically before and after culture, and also by its cultured peculiarities. For the preparation of vaccines and for opsonic estimations, cultures on blood-agar not more than 24 hours old were employed. It was found by experience that older cultures were much less potent and less reliable. Stress is laid upon the importance of thorough agitation of the emulsions in a mechanical shaker, in order to produce uniformity of strength in the product. Sterilisation and standardisation of the emulsions were carried out in the usual way.

In most of the cases the opsonic index was frequently estimated, but in some the clinical symptoms were the only guide. In most a polyvalent serum of either three or ten strains was used; in others the vaccine was auto-genous. The results in the latter were slightly superior. The experience of the authors is distinctly opposed to the use of large doses, which have apparently been necessary where cultures of same eye were employed. Small doses at short intervals gave the best results; 10,000,000 being their maximum dose, while much smaller numbers were usually employed. Especially in acute cases only the smallest doses (500,000 to 2,000,000) are permissible. A dose is assumed to be excessive if followed by an appreciable rise of temperature or other constitutional disturbance.

The slight increase of the symptoms, local and constitutional, which follows each injection is associated with the negative phase of the opsonic index, which with the smaller doses is relatively slight, and soon gives place to a moderate rise in the opsonic index. The small dose (by which the authors mean a dose of 500,000 to 3,000,000 cocci) confers all the benefits of the large dose and is without its disadvantages. By repeating it at intervals of a few days, the conditions favourable to cure are most easily established.

Details are furnished of the methods and results of treatment in cases of acute gonorrhœa, simple chronic gonorrhœa, and chronic gonorrhœa with complications. For these the reader is referred to the original, but the following details may be given of four cases of chronic gonorrhœa with iritis:

CASE 1.—Gleet for ten months in this his third attack of gonorrhœa. Right pupil dilated with atropin and irregular; chemosis; conjunctiva very injected; lacrymation; no purulent discharge; the eye extremely painful. By the second injection the pain had almost disappeared from the eye, which in all ways appeared better. After the second injection, pain disappeared. Treatment for two and a half months, when the iritis was cured and the sight perfect.

Case 2.—Present attack of gonorrhœa contracted five months ago. Three recurrent attacks of bilateral conjunctivitis but no pain or loss of sight. Present attack, left eye only, started one month previously, great pain, congestion and loss of sight, ciliary injection, iris muddy, no reaction of pupil to light, pupil irregular, cornea hazy, with deposits in anterior chamber. Pain relieved within 48 hours of first injection, gone in four days; sight returning, eye steadily improving. There had been no relief prior to vaccine whilst under treatment by fomentations and atropin.

Case 3. – Present attack of gonorrhœa contracted one month before commencement of iritis. Lids injected and swollen, muco-purulent discharge, but gonococci absent, conjunctiva injected, chemosis, cornea healthy. Eleven days after admission, arthritis of knee and elbow. Iritis well and patient discharged well in a month from first vaccine injection.

Case 4.—Admitted with "cold" in the right eye. Marked conjunctival injection, discharge, very severe pain, especially at night, cornea cloudy, pupils dilated, iris dirty-coloured, condition getting worse. One month from date of admission eye greatly improved, no discharge, iris clear, no conjunctivitis, cornea normal. Pain relieved after first injection, cured after the second.

A. J. Ballantyne.

(5) **Brunetière** comes to the following conclusions regarding acoin.—(1) Acoin is indicated in subconjunctival and intramuscular injections. Compared with cocain it is inferior in power, but much superior in duration of analgesia. It is not dangerous to use. (2) It is unstable and forms insoluble precipitates with most solutions of drugs. Thus, it forms heavy precipitates with benzoate and biniodide of mercury and with perchloride of mercury, and less marked reaction with chloride of sodium and iodide of potassium. With cyanide of mercury no reaction is apparent. With biniodised oil there is no reaction. These chemical changes diminish the analgesic action of acoin. (3) In order to obtain the maximum effect of the acoin for subconjunctival or intramuscular injections it is advisable first to inject the solution of acoin, and then after a few minutes, the active substance. (4) Acoinised oil can be conveniently mixed with biniodised oil, but the effect of the acoin used in this way does not seem any better than that of aqueous solutions.

Ernest Thomson.

(6) It will be within the recollection of readers of The Ophthalmoscope that the so-called "combined treatment" of diseases of the eye was advocated some short time ago by Burnham, of Toronto, in a small book reviewed in these columns on November 1st, 1906 (p. 656). The method consisted of the hypodermic injection of pilocarpine, together with the internal administration of mercury and potassium iodide. **Wood** (Shrewsbury) has employed Burnham's plan with benefit in several cases, but, in his experience, the pilocarpine injections produced profound depression. He has, therefore, been led to substitute guaiacol for pilocarpine. Profuse diaphoresis follows the smearing of guaiacol on the skin. Wood, who has now tried this modified method in nearly forty cases with excellent results, believes that it is especially indicated in irido-cyclitis, vitreous opacities, and interstitial keratitis. His experience has convinced him that guaiacol is a far more certain diaphoretic than pilocarpine; that it does not give rise to the after-depression of pilocarpine; and, lastly, that it is equally efficacious as regards the cure of eye disease. Details follow:—the ordinary alterative mixture of sublimate, gr. 1/16, and potassium iodide, grs. 5, is given thrice a day. As an alternative, mercury with chalk, gr. 1, is administered thrice a day, together with a mixture of potassium iodide and tincture of nux vomica. The patient is kept in bed between blankets with a couple of hot water bottles. The skin of the axilla or epigastrium is smeared with one drachm of a mixture of equal parts of olive oil and guaiacol, an amount that is usually enough to induce free perspiration. The parts are covered with oil silk and a wool pad. A hot drink is given. As a rule, twelve such applications are made, and the patients are kept in bed during the whole time. After an intermission, the treatment can be begun again if thought necessary. Sydney Stephenson.

(7) **Coover**, of Denver, U.S.A., describes his experience in some affections of

the eye by means of *intermittent x-rays*, the application of which requires a specially designed apparatus, consisting of a small motor, a condensor, a moving shaft, and a regulator. Forty to six hundred flashes can be given in a minute, but in eye conditions the best results are obtained by seventy-five to one hundred and fifty flashes per minute, and by a working distance from the tube of fifteen inches. The cases treated by these means numbered nine, and included corneal ulcers (4), irido-cyclitis (2), and optic atrophy (3). Excellent results were obtained in corneal ulcers, the resulting opacities being very slight. A patient with post-operative cyclitis after ten applications of the x-rays, declared she could see better, and the vitreous opacities that were present had cleared to such an extent that a red reflex could be elicited from the fundus. A case of serous iritis was discharged "cured" after seven applications. This patient, it may be noted, suffered from tuberculosis and syphilis, but was given no constitutional treatment. Vision in the first case of optic atrophy, which dated from infancy, rose under treatment from perception of light to "O.D. 20 M. at six inches." In the second case vision dose from perception of light to "30 M. letter at twelve inches"; and in the third case, after twelve applications, from 6/36 to more than 6/12.

SYDNEY STEPHENSON.

(8) **Fortunati** (Rome) first discusses the results obtained by other authors by the radium treatment of trachoma. In 1905-1906 experiments were carried out with radium in Rome, the results of which were so little convincing in four cases that they were discontinued. But, later, some new facts were demonstrated, which led to considerable alteration in the views held up to that time. Two of the patients who had been treated without success with radium were afterwards treated with copper sulphate, and were cured in a surprisingly short time. In the years 1905, 1906, and 1907, the radium treatment was therefore resumed, and after a brief interval was followed by treatment with copper sulphate. The result was excellent. Eight typical cases of trachoma in various stages of the disease were treated, and in six of these cases there was also a more or less severe pannus. Fortunati gives briefly the histories of these patients. The pannus was treated with a capsule containing 10 mg. of radium bromide, which was held at a distance of 5 mm. from the cornea, trachoma was treated with a very fine fold of gutta-percha with 3 mg. of radium bromide, placed directly upon the diseased conjunctiva. The treatment was applied in zones. Clinically, the observations showed that radium had no kind of macroscopically visible healing influence. On the contrary, it appeared to have an irritating action, as shown by lively hyperæmia, and by abundant muco-purulent discharge from the eye. Without doubt, however, it altered the neoplastic tissue, so that it rendered possible the action of an irritant, such as copper sulphate or silver nitrate, when applied to the parts later. A series of microscopical investigations were also undertaken. Fortunati explains the histological findings in the following way.—The adenoid tissue, so marked in cases of untreated trachoma, becomes considerably changed by the action of radium. The permeability of the vessels is increased, and in that way the tissues become better nourished. The formation of fibrous tissue is checked, and it is replaced by a hypoplastic condition and is changed into adenoid tissue, like that of the normal conjunctiva.

(9) Apropos Wood's communication (see above), **A. S. Green,** of Lincoln, states that guaiacol was formerly used at the Meath Hospital, Dublin, for the purpose of reducing high temperature in enteric fever and acute rheumatism, but had to be discarded, because its action could not be limited and also because it was liable to cause collapse. SYDNEY STEPHENSON.

XX.—MISCELLANEOUS.

Demaria.—Hypertrophy of the external ocular muscles. (Sobre hipertrofia de los musculos del ojo.) *Archiv. de Oftal. Hisp.-Amer.*, June, 1907.

Demaria has noticed in some cases of exophthalmos that the movements of the eye are not only not diminished but even increased. In one such case he had the opportunity to examine the muscle after removal of the eye for malignant tumour. He found the cross-section of the muscle five times larger than that of a normal muscle. He considers the cause of the hypertrophy to be over-action. HAROLD GRIMSDALE.

Coats, George.—The pathology of coloboma at the nerve entrance. *Royal London Ophthalmic Hospital Reports*, Vol. 17, Part II.

After some preliminary remarks, a historical sketch of the condition from 1858 (when van Ammon described the condition in the fœtus of a sheep) is given and this occupies 16 pages. **Coats** (London) then describes three cases of his own. From a pathological standpoint, he arranges the cases in three groups :

(1) Those in which the lesion is a coloboma of the choroid beneath the nerve, the nerve itself being normal and only sharing passively in the deformity.

(2) Those in which the lesion is a coloboma of the choroid and nerve.

(3) Those in which the lesion is a coloboma of the nerve alone, the adjacent choroid being normal.

After a full description of these cases, Fuchs' coloboma is discussed, but Coats has no personal observations to record, but gathers from literature what is known concerning the condition. The paper is a long and interesting one, although very difficult to abstract. It is illustrated with photomicrographs.
C. DEVEREUX MARSHALL.

Scalinci, Noe. — Investigations into the physico-chemical, properties of the aqueous humour. (Untersuchungen über die physicalisch-chemischen Eigenschaften des Humor aqueus.) *Archiv. f. Augenheilk.*, Mai, 1907.

Hancock, W. Ilbert.—Hereditary optic atrophy (Leber's disease). *Royal London Ophthalmic Hospital Reports*, Vol. 17, Part II.

The patient here reported was a man, aged 26, whose sight commenced to fail seven months before **Hancock** (London) saw him. The failure was very rapid, and at the end of two weeks he was unable to read even the largest print. There was no headache or pain in the eyeballs. When seen, he was unable to do more than count figures. Both optic nerves showed marked pallor, especially in the temporal halves ; there was an indefinite haze in the surrounding retina, there were no hæmorrhages, but the physiological cups were filled in. His fields, although with normal peripheral vision, had a central scotoma for white. He was a moderate smoker, but for six months he had not smoked at all ; he was also a total abstainer, with no syphilitic history. He occasionally had epileptic attacks, which had diminished with bromide. Twelve members of his family in five generations had suffered from failure of sight. A family tree is appended to the communication.

The patient was advised to take a prolonged voyage, and the bromide was

reduced and arsenic was added to his medicine. He improved, with correction, to $\frac{6}{24}$ and J.4 in both eyes and the scotoma for white cleared at the centre, being only a narrow blind ring surrounding the macula; the peripheral field remained full.

An account of the family is given; of the 12 affected, 6 had practically recovered their sight and 1 was said to be improving. This is an unusual number of recoveries, although such cases have been recorded.

In this family consanguinity played no part, and tobacco and alcohol appear to have had little or no influence on the disease. A full bibliography is appended. C. DEVEREUX MARSHALL.

Schiele, A.—On the reciprocal relation of hemeralopia and keratomalacia. (Ueber das gegenseitige Verhältnis von Hemeralopie und Keratomalacie.) *Wochenschrift für Therapie und Hygiene des Auges*, Dezember 26, 1907.

Schiele gives a table of all his cases of idiopathic hemeralopia and keratomalacia showing the monthly incidence for the years 1904, '05, '06. There were 119 cases of the former, most of whom were adults, to 33 cases of infants with the latter affection, 13 of whom were already totally blind, and 7 had lost one eye. The great majority of both occurred during the spring months in association with the season of fasts. The author believes that owing to an altered condition of the blood resulting from impaired liver function due to absence of fat in the diet (milk in the case of infants), the mucous membranes become susceptible to such weak saprophytes as the so-called bacillus xerosis. One mother brought her infant with both eyes destroyed. In the absence of her own milk she had withheld even cow's milk owing to the fast. After warning her about any subsequent child she returned a year later with hemeralopia and an infant in whom the cornea already showed evidence of keratomalacia. The mother was ordered cod-liver oil, and the child's eyes cleared except for a small macula on one cornea.

W. B. INGLIS POLLOCK.

Gabriélidès, A. — Tarsoconjunctivitis proliferans: Histology: Statistics. (Tarsoconjonctivité proliférante; Histologie; Statistique.) *La Clinique Ophtalmologique*, 25 janvier, 1908.

The principal point in the paper of **Gabriélidès** (Constantinople) on spring catarrh is that he has found in this disease a local increase in polynuclear eosinophiles, such as is not seen in trachoma, xanthelasma, chalazion, papillomata and epitheliomata of the conjunctiva, nor in the normal conjunctiva. In one particular case, which he investigated thoroughly, he found that the blood in general contained seven polynuclear eosinophiles out of three hundred white cells, while the blood from the conjunctival tumour (*tumeur printanière*) contained twenty-nine out of three hundred. Gabriélidès thinks that this fact may assist in diagnosis. Eosinophiles should be sought for in histological sections and in the discharge. If there is no discharge, then the local blood should be examined. Details of the staining method employed are given. ERNEST THOMSON.

Palomar.—Primary deep periostitis of the orbit. (Osteo-periostitis orbitaria profunda primitiva.) *Clinica y Laboratorio*, January, 1908.

Although most of the deep inflammations occurring in the orbit are certainly secondary to septic inflammation elsewhere, *e.g.*, in the accessory

nasal sinuses, there are a number of cases in which the mechanism of infection cannot be found and these seem to deserve the name of primary. **Palomar** gives the history of one such case, and expresses his opinion that the fortunate result thereof, was due largely to the fact that early incision was made into the inflamed region. He points out that the best place for such an incision, except in unusual circumstances, is the lower and outer part of the orbit. There can be little risk here of damage to the important parts, and it is easy, as a rule, to reach the abscess cavity. It is not advisable to inject antiseptic fluids. HAROLD GRIMSDALE.

Consiglio.—Some observations on the passage of fluorescein into the eye. (Alcune osservazioni sul passagio della fluoresceina nell'occhio.) *Rivista Italiana di Ottalmologia*, Jan., 1908.

As a result of experiments on animals, **Consiglio** concludes that heat and cold are able to modify the time of appearance of the "line of Ehrlich" in the living animal, an increase of temperature facilitating the entrance of fluorescein into the anterior chamber from the blood, and therefore hastening the appearance of the line of Ehrlich. He further observed that in the dead eye the line of Ehrlich, if it had appeared, might be dissipated by heat, and would return on the application of cold. Hyperemia of the eye favours the rapid appearance, as might be expected.

HAROLD GRIMSDALE.

Alfieri, Alessandro.—A case of complete amyloid degeneration of the conjunctiva, in which the cornea participated. (Un caso di totale degenerazione amiloide della congiuntiva con estesa partecipazione della cornea.) *Rivista Ital. di Ottalmologia*, Jan.-Feb., 1908.

Alfieri gives the history and microscopical appearances of a case of this rare condition which came under his care at Salonica. The right eye, according to the history, had been affected for two years, and had gradually reached the condition in which Alfieri found it. He is, however, inclined to put the onset at a more remote date.

What first struck the observer was the enormous thickening of the two lids; the upper had the size of half a pigeon's egg, and this was due to the great increase of the tarsal plate, which was almost bony in hardness; the skin was normal and perfectly movable over the tarsus. The lower lid was equally thickened and markedly everted; the conjunctiva over it seemed pale and had taken on the appearance of skin; the conjunctiva of the upper lid had the same appearance, and had, without being everted, lost all contact with the globe on account of the enormous thickening of the conjunctiva of the fornix and globe. On opening the palpebral fissure, the whole of the conjunctiva of the *cul-de-sac* became visible, projecting forwards as a thickened mass.

Separating the lids slightly with squint hooks (since the thickening of the conjunctiva did not allow the introduction of the smallest elevator), the only part of the cornea that could be seen was the upper and outer sector, which was slightly opaque. The rest of the corneal surface was connected with the mass into which the conjunctiva was transformed.

The nature of the disease was not recognised, and the diagnosis of malignant disease was made. The eye was removed, with all the conjunctiva, and the parts examined microscopically. It was then apparent that the condition was one of amyloid degeneration, which, contrary to the usually accepted views, had invaded the cornea. Two microphotographs are given.

HAROLD GRIMSDALE.

Levaditi.—The serum diagnosis of syphilis. (Le sero-diagnostic de la Syphilis.) *La Clinique Ophtalmologique*, 10 mars, 1908.

Levaditi's summary of Wassermann's serum reaction should be read in the original.

Seitz, R.—Visual curves. (Visuscurven.) *Arch. f. Augenh.*, Bd., LX, Heft 1. April, 1908, S. 58-59. Illust.

Seitz makes use of the ordinary perimeter charts for recording the acuity of vision in the form of a curve. He thinks that such a method of recording the patient's vision is desirable where the patient is tested several times under varying conditions, and one wishes to compare the results.

P. J. HAY.

Rabinowitsch, S.—On the progress of the liminal sensitiveness during adaptation for diminished light, and its dependence upon the illumination which has preceded. (Ueber den Gang der Schwellenempfindlichkeit bei Dunkeladaptation und seine Abhängigkeit von der vorausgegangenen Belichtung.) *Zeitschrift fur Augenheilkunde*, April and May, 1908.

Rabinowitsch (Berlin).—The translation of the title of this paper presents great difficulties. As used here the German word *Schwelle—a threshold*—has no English equivalent. The degree of light which with a given retinal sensitiveness the eye can just appreciate is the *threshold value* that degree, or, as we have expressed it, the *liminal-sensitiveness*. The author has repeated and enlarged the scope of Piper's work on adaptation. The experiments were carried out with Nagel's adaptometer. The examinee was tested after a night's sleep in a completely dark room. It appears that when an eye is removed from bright illumination into a dark room, there is only a slow exaltation of the retinal excitability for the first ten or twelve minutes, but in the next half-hour it rapidly rises, and then again slowly increases in an asymptotic curve, which probably only reaches its highest point after several days! The whole curve is an S-shaped one. The paper is philosophical, and the concrete mind, possessed by the average clinician, finds it a little hard to assimilate.

T. HARRISON BUTLER.

Villard.—A case of sudden death in the course of traumatic irido-cyclitis. (Un cas de mort subite dans le cours d'une irido-cyclite traumatique.) *Ann. d'Oculistique*, T. CXXXIX, p. 358, mai, 1908.

Villard's patient, a man, aged 20, received a slight injury to his right cornea with a chip of metal, which he easily removed himself. For ten days there was scarcely any inflammation in the eye, but later irido-cyclitis with hypopyon developed. This was improving when the patient suddenly died on the twenty-sixth day after his accident. The author considers that the death was probably caused by a cerebral embolism derived from a clot in the orbital veins which had become infected from the vessels of the iris and ciliary body.

R. J. COULTER.

Sauvineau.—A centesimal scale for measuring the chromatic sense. (Eschelle centésimale pour la mensuration du sens chromatique.) *Ann. d'Oculistique*, T. CXL, p. 13, juillet, 1908.

Sauvineau has had a series of experiments carried out by his assistant Coudour, from which he concludes that an eye with normal vision should be

able to recognise at a distance of 5 metres the colours of a disc of red or green glass 1 mm. in diameter placed in front of a lantern. Adopting this amount of colour vision as unity, he proposes to denominate the power of recognising discs of 2, 3, 4 etc., mm. in diameter respectively as 9/10, 8/10, 7/10, etc., and is having a lantern made in which glasses of various colours can be brought successively behind circular apertures of a diameter varying from 1 mm. to 10 mm. He finds by calculation that anyone able to distinguish at a distance of 5 metres the colour of circles 2 mm. in diameter, would be able to see the signals in use on the French railways at the required distances, and is of opinion that his scale would be useful in standardising the tests for colour-vision, in examining for central scotomata, etc. R. J. COULTER.

Villard, H.—Palpebral phthiriasis. (Phtiriase palpebrale.) *Archives d'Ophtalmologie*, août, 1908.

Villard (Montpellier) publishes five cases of palpebral phthiriasis and analyses the outstanding features of the affection by reference to the literature. Relying upon the figures compiled by Hirschberg (3 cases among 40,000 patients), and Webster (1 case amongst 50,000 patients), and Julien (1 case amongst 5,000 patients), and Despagnet (2 cases in twelve years at Galezowski's clinique) Villard claims that the condition is very rare. The truth is that amongst certain classes it is rare. Doubtless, in an ordinary hospital clinique, lice in the lashes are seldom recognised, but elsewhere—as, for example, in poor-class schools—the condition is by no means unfamiliar to those who have learned how to recognise it. It is another instance of disease appearing to vary both in frequency and modality according to the circumstances under which it is found. SYDNEY STEPHENSON.

Campos.—New formulæ for estimating the extent to which correcting lenses should be decentered and for determining the inter-optic line. (Nouvelles formules pour l'évaluation du décentrage des verres correcteurs et la détermination de la ligne interoptique.) *Ann. d'Oculistique*, T. CXL, p. 344, novembre, 1908.

Campos gives some new formulæ for calculating the length of the inter-optic line and shows how the amount of lateral decentering necessary for near vision can be determined geometrically. He points out that each defect of deviation has a convex lens which corrects it without being decentered, and that the direction in which any convex glass should be decentered in order to correct a given deviation depends on whether it is weaker or stronger than the one which automatically corrects it. R. J. COULTER.

Brandès, F.—Self-mutilation of the Eye. (Suites de mutilation systématique et intentionnelle de l'œil.) *Bull. de la Société Belge d'Ophtalmologie*, No. 25, 1908, p. 112.

Brandès (Antwerp), reports a case of self-mutilation of the eye, observed in a dull girl of 15 years, whose home surroundings were of a somewhat unsatisfactory nature. She suffered from a severe form of conjunctivitis—the lower cul-de-sac was swollen, fleshy-looking, and covered with false membranes, while a ragged ulceration lay towards the outer third. The corresponding parts of the ocular conjunctiva were inflamed, and the neighbouring cornea was greyish. It was suggested by the patient that the conditions might have resulted from a slight injury to the eye inflicted by a soiled handkerchief. Bacteriological examination of morsels of the affected

conjunctiva yielded negative results. The inflammation receded without special treatment. But one month later, the girl was re-admitted with precisely similar lesions. Bacteriological examination was again negative. The condition got well, but there were other recurrences, and to shorten the story, the girl eventually confessed that she had put green soap (*savon vert*) into her eye. The motive seemed to be to escape work by being allowed to enter hospital as an in-patient. It was an example, in short, of what has been termed by Dieulafoy "pathomimy." SYDNEY STEPHENSON.

Lint, A. van.—The sight required by chauffeurs. (A propos de l'acuité visuelle exigée des chauffeurs d'automobiles.) *Bull. de la Société Belge d'Ophtalmologie*, No. 25, 1908, p. 118.

van Lint (Brussels).—That for chauffeurs one should adopt, as the minimal visual acuity, $\frac{1}{2}$ in one eye and $\frac{1}{4}$ in the other eye, after correction of any ametropia that may exist. H. COPPEZ.

Weber.—Bilateral Anophthalmia. (Observation d'anophtalmie double). *Bull. de la Société Belge d'Ophtalmologie*, No. 25, 1908, p. 119.

Weber (Verviers) reports a case of double anophthalmia in a baby aged two days. The upper eyelids were smaller than normal, and the vertical dimension of the palpebral fissures did not exceed 3 mm. or 4 mm. at the outside. There was no trace of the eyeball, and no shrunken globe could be felt in the orbit, but whether such examination was carried out under the influence of a general anæsthetic, is not stated. Apart from the eyes, the baby presented no congenital anomalies. SYDNEY STEPHENSON.

Nuel, J. P.—Vesicular œdema of the macula lutea. *Bull. de la Société Belge d'Ophtalmologie*, No. 25, 1908, p. 46.

In aged persons suffering from arterio-sclerosis a more or less pronounced amblyopia may come on, with the appearance in the macular region of small clear discs, 50 to 100 in number, and having one-fifth or less the diameter of the optic papilla. Although the affection does not lead to blindness, yet it does not seem capable of undergoing any notable improvement. The choroid shows no changes; there is neither pigmentation nor atrophy. The seat of the affection is exclusively retinal. **Nuel** (Liège) by microscopical examination, has found a system of lacunæ, representing œdema, in Henle's layer. The œdema represents a circulatory difficulty, and there may be concomitant retinal hæmorrhages. H. COPPEZ.

Dodge and Diefendorf.—An analysis of the involuntary eye movements in a case of congenital, binocular, lateral nystagmus from photographic records. *Archives of Ophthalmology*, January, 1909.

By their experiments upon a case of nystagmus, **Dodge and Diefendorf** have arrived at an absolute refutation of v. Arlt's hypothesis, namely, that the nystagmus deviation was motived by the effort to move the object of interest to the fresh part of the retina. The reflection of a luminous point on the cornea was photographed on a slowly falling plate, and in this way photographic records were obtained of the eye movements. These records showed that, at that part of the nystagmic wave where the nystagmic deviation was greatest, movement was so rapid that effective vision was precluded, and therefore v. Arlt's theory falls to the ground. The records explain the fact that vision is unaffected, even when the nystagmic deviation is large. In the

case examined the deviation was 5°, but one-half of this was attained in one-fifth of the time of the whole oscillation, in two-thirds of the time the eye was moving so slowly as to be little more unsteady that the normal eye during fixation. The return movement is not a reaction dependent upon the amount of the deviation, since ocular reaction times are long, more than 160, and the rapid eye movements are moments of practical blindness. The authors consider that the origin of the impulses to the two movements lie at different levels in the nervous organisation, and the nystagmic deviation is probably primarily a matter of asymmetrical muscular balance which the co-ordinating apparatus is called on to correct without being able to eradicate.

The correcting movement is a co-ordinate movement with its origin in the same complex motor facts as cause the nystagmic deviation. ROSA FORD.

Krusius.—The pathology of fusion. (Zur Pathologie der Fusion.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1908. Volume published 1909, p. 109.

As Bielschowsky said in the discussion that followed the reading of the paper by **Krusius** (Marburg) "there is nothing in the therapeutic measures suggested that has not already been carried out by Priestley Smith and Claude Worth." We might carry the point a little further, and say there is nothing of value in the whole paper that is not contained in Worth's book on *Squint*. The amblyoscope figured in the text is Worth's instrument with a universal, wholly unnecessary, joint added, and sundry other small additions, which are by no means original. It is, however, fair to the author to state that he mentions the fact that his theory of squint and Worth's "cover the same ground;" they are, in fact, identical, and Worth's has the advantage of long priority.

Krusius finds that if we study a series of cases with defective fusion, we can discover three factors: a deficient fusion power, unilateral or bilateral elimination of visual acuity, and a strabismus, either confined to one eye or alternating. One of these factors is constant in all cases, namely, a defective power of fusion. This is the central and most essential factor of the three.

. In all cases of functional amblyopia the amblyopic eye is in some way inferior to the other eye, either anatomically or in some small organic feature. One eye is, so to say, predestined to become amblyopic.

Therapy must be begun at as young an age as possible. We must try to improve the amblyopia, or to prevent its onset; and orthopic exercises to train the fusion sense must be adopted. T. HARRISON BUTLER.

Howe, Lucien.—On the measurement of the lifting power of the adductors and of the abductors. *XI Congresso Internazionale di Oftalmologia*, Fascicolo primo, p. 61, Aprile 2-7, 1909.

Landolt, E. — The complete material of ocular surgery. (Le materiel complet de chirurgie oculaire.) *XI Congresso Internazionale di Oftalmologia*, Fascicolo primo, p. 72, Aprile 2-7, 1909.

Oliver, Charles E. — The requirements and the regulation of signalling by colour. *XI Congresso Internazionale di Oftalmologia*, Fascicolo primo, p. 81, Aprile 2-7, 1909.

A modification of the cutaneous tuberculin reaction. *Lancet*, April 24th, 1909.

The cutaneous tuberculin reaction for the diagnosis of tuberculosis was first introduced by von Pirquet, and the *technique* recommended by him

was as follows.—The skin, preferably of the arm where the test was to be made was thoroughly cleansed and a drop of a 25 per cent. solution of Koch's old tuberculin was placed on the arm ; the skin was then scratched through the drop by means of a vaccinating lancet or Pirquet's raspatory. For purposes of control other scratches were made without the tuberculin having been applied. Von Pirquet subsequently thought it better to use different concentrations of the solution. After about one and a half hours a very slight redness appeared at the spot of inoculation and also at the spot of the control scratch. This was regarded as due to the slight traumatic irritation caused by the actual performance of the inoculation. This redness disappeared after an hour or two, and if a positive result followed on the site of the inoculation of tuberculin, in about three hours a reddening of the skin appeared, which increased until it reached a maximum ; this usually took from 12 to 24 hours. In the *Répertoire de Pharmacie* for February a description is given of **Lautier's** modification of the above process. A pledget of cotton-wool of the size of a pea is moistened with three drops of a solution of tuberculin and applied to the unbroken skin on the outer surface of the arm. The application is covered with gutta-percha tissue and a pad of cotton wool, kept in position with a bandage. It is important that the skin should be intact and cleansed with alcohol and ether just before the dressing is applied. Within 24 hours, if the reaction is positive, the patient will complain of irritation which increases during the ensuing 24 hours. The dressing is then removed, and, in the case of a positive reaction, redness and sometimes papules will be observed. The reaction may manifest itself within half an hour and varies in intensity as regards redness, swelling, dryness to the touch, and tenderness produced by pressure. The results of this method were controlled by the ophthalmic reaction.

Gowers, Sir William R. — A lecture on a case of unilateral optic neuritis from intra-cranial tumour. *Lancet*, July 10th, 1909.

Sir William Gowers' case is that of a woman of 37 years, without any suggested family or personal history, who, for two or three years, had suffered from increasingly severe headache, and a tendency to be easily fatigued. Nausea and vomiting then came on, and, latterly, deterioration of vision of the left eye, with occasional paroxysms of dimness of vision of the right eye. Ophthalmoscopic examination showed that on the right side there was optic neuritis of moderate intensity (V.A. = $\frac{6}{6}$); on the left side no trace of neuritis, past or present, but the disc presented a greyish tint as if atrophy were commencing. There was a small central scotoma for white and colours. The pupils acted to light on each side, but on the left the contraction was not maintained. The sense of smell was abolished on the left side, and there were other symptoms, which, taken all together, led to the diagnosis of a growth in the front of the base of the brain exerting pressure on the left side, damaging the olfactory and optic nerves, and on the right side (that of the optic neuritis) apparently pressing backwards on to the hemispheres. Operation was attempted, but the patient succumbed. The tumour was a flattened growth lying between the under surface of the frontal lobes and the orbital plates, and occupying a depression in the brain. It was medial and almost symmetrical, measuring $2\frac{1}{2}$ inches antero-posteriorly, $2\frac{5}{8}$ inches from side to side, and $1\frac{5}{8}$ inches in thickness. It was nowhere attached to the brain, but had apparently sprung from the dura over the crista galli. In structure it was an indurated epithelioma. The tumour had lain above the optic nerves and had pressed back the chiasm. The left nerve had been more compressed than the

right, and had evidently suffered longer from the compression; there was, owing to the compression, no distention of the left sheath, while there was moderate distention of the right The author considers that the growth was due to some residual developmental tissues of the dura mater, remaining where it was completed at the middle line, and subsequently taking on a process of growth. He quotes a very similar case by Schultz-Zehden.

An interesting point emerged from the microscopic examination of the nerves by L. J. Paton. In the left nerve he found, a little in front of the chiasma, a compact fasciculus of degenerated fibres in the outer part of the nerve, and none in the axial seguin. Gower says that we must assume that these are the central degenerated fibres, and that the unusual position reminds us that the observed facts, on which rests our belief in their axial position, are not very numerous.

With regard to the diagnosis, Gower points out that bi-laterality of optic neuritis is an unfailing occurrence in ordinary intra-cranial tumours, although one eye may suffer a little sooner than the other. The cases in which visible monocular neuritis has occurred demonstrate the exceptional nature of cases of this character, and justify the assumption that they are not due to the grave disease which is the common cause of the morbid process in the bilateral forms.

The tumour *in situ* is shown in a photograph of the under surface of the brain. The lecture contains much that will repay perusal of the original.

ERNEST THOMSON.

BOOK NOTICES.

The Ophthalmic Year Book. Volume VI. Containing a digest of the literature of ophthalmology, with index of publications, for the year 1908. By EDWARD JACKSON, GEORGE E. DE SCHWEINITZ, and THEODORE SCHNEIDEMAN. Illustrated. The Herrick Book and Stationery Company, Denver, Colorado, U.S.A. 1909.

The *Ophthalmic Year Book* fully maintains its reputation, and is a publication that no serious ophthalmic surgeon can afford to disregard. It is so well arranged that any item can be found with a minimum of trouble. It may be most cordially recommended.

Refraction and how to Refract. By JAMES THORINGTON, A.M., M.D. Third edition. London: REBMAN, LIMITED, 129, Shaftesbury Avenue, W.C. 1908. Price 1·50 net.

Thorington's *Refraction* is deservedly popular amongst those for whom it it is primarily written, namely, students and practitioners who have a limited knowledge of mathematics and who on that account cannot readily appreciate the classical treatise of Donders. The book is well arranged, and the author nearly always manages to convey his meaning clearly. As an elementary treatise, likely to be most useful to beginners, Thorington's book can be highly recommended.

Atlas of the External Diseases of the Eye including a brief Treatise on the Pathology and Treatment. By Professor O. HAAB, of Zürich. Edition with additions by G. E. de Schweinitz, M.D. Third edition, revised, 98 coloured illustrations on 48 lithographic plates, and 232 pages of text. Philadelphia and London: W.B. Saunders Company. 1909. Cloth 13s. net.

Haab's *Atlas and Epitome of External Diseases of the Eye* has now reached a third edition. We know no better guide for students and practitioners, to whose notice we strongly commend the *Atlas*. The coloured illustrations, the work of J. Fink, of Munich, are simply life-like, and should be a great help to those studying eye disease. Finally, a word of praise should be given to the translator, who writes exceptionally clear English. It may, indeed, be doubted whether from cover to cover the *Atlas* contains one single sentence the meaning of which is obscure.

Blindheit und Blindenwesen. (**Blindness and Blind-life.**) Von Dr. med. HÜBNER in Cassel. Halle a. S.: Carl Marhold, 1909. Bd. VIII, Heft I. S. 38. 1.20 Mark.

This pamphlet is one of the short treatises published under the supervision of Dr. A. Vossius, the well-known ophthalmologist of Vienna. Dr. Hübner commences his essay by considering the various conditions to which the term blindness is applied in ordinary parlance and in scientific language. Ordinarily, a man is said to be blind when he cannot see sufficiently well to distinguish large objects a few feet distant, or to pursue any craft or to obtain his own living; but cases are sometimes met with, as in glaucoma, where small objects can be discerned, yet the field of vision is so restricted that no occupation can be followed. Are these blind? A distinction must be drawn between congenital and acquired blindness. Amongst the conditions associated with congenital blindness are anophthalmos, or total absence of the eyes, and microphthalmos or imperfectly developed eye, and various congenital defects consequent on intrauterine inflammation and infantile glaucoma buphthalmos. Then the acquired forms of blindness are enumerated, as those proceeding from infectious diseases, blood, renal, and syphilitic affections, trachoma, many of which are preventable. Efforts are being made to arrest the progress of myopia by improvements in school hygiene, and the extension of the facilities for acquiring a knowledge and diagnosis of disease by the use of the ophthalmoscope has proved of service, so that whilst the total number of the blind in Prussia in 1871 was 22,978, or 9·3 per 10,000 of their population, in 1905 the number of the blind was 21,039 and the proportion was 5·6 to 10,000 of the population, the proportion between the sexes being 10,979 males and 10,040 females. In 1905 amongst the 21,019 blind there were 1,755 children under the age of 15, and of these only 774, or 44·1 per cent., were in blind asylums.

In regard to the occupations of the blind, the subjects of this affliction were formerly much neglected and earned a precarious existence as street singers, harpists and fiddlers at wakes and festivals, but during the last century great efforts have been made to alleviate their condition; attempts to educate the blind by developing their sense of touch and teaching them to write were commenced three hundred years ago. The earliest was by means of the so-called Quippos, where knots of various size and with various intervals were made in woollen bands. Many of these were found by the Spaniards at the sacking of Peru in 1779. The blind Jacob von Netra, in Hessen, employed a notched stick. Then came Mdlle. Paradis and Haüy's embossed characters,

but the type for the blind of the present time is the point or raised dot system, which proceeds on the well-proven fact that raised points are more readily recognised than raised lines. This method was foreshadowed by Fraülein v. Salignac, who indicated the alphabet by perforations with a knitting needle, a plan adopted by Fraülein v. Paradis and Klein. But the first who undertook the problem of the point system of the present day was Pastor Engelmann, of Linz, in or near the year 1823. About the same time a French officer named Barbier, who lived from 1767 to 1841, suggested the so-called sonographic alphabet in which six vertically arranged and two horizontally disposed points supplied the means of recognising the 36 tones used in the French language. This was the foundation of the Braille system. Louis Braille, who was himself blind, lived from 1809 to 1852. He reduced the number of points from 36 to six, recognising that the number of points in the Linz system was too large, and the Braille system is that which is now in general use, certain abreviations on a kind of shorthand aiding the speech of writing and reading. It is said that a precocious blind child will read this type nearly as rapidly as an ordinary school child will common print. In the Blind Institute at Steglitz, near Berlin, 6,000 books in raised type are at the disposal of the blind, and the German Bibliothek or Institute for the Blind can supply 7,500 volumes and many pieces of music. Since the points of the two forefingers by constant use are apt to become hard and relatively insensitive, it is recommended to rub the tips with pumice stone. The Braille system can be employed for arithmetical and other calculations, and, notably, for instruction in geography. The instructor of the blind, Kunz, from careful observation has satisfied himself that the sense of hearing for distance is wholly independent of the extent of the scale of what is termed a musical ear and of the craniotympanic conduction of some. Medicine and Natural Science are closed books for the blind, but they may pursue the art of massage and the cure or relief of defects of speech. With some reservations the study of jurisprudence may be considered, but the blind man cannot compare or verify handwriting, read protocols, and the like. Theology may be pursued. Blindness constitutes no bar to the performance of the Holy Office. Mathematics and the scientific study of music are not recommended by a blind student, who has gone successfully through a course of instruction. History and literature, political economy and journalism are open to the blind. A sufficient income can be derived from giving instruction in languages. The blind can undertake the making of mats and brushes with profit. Knitting and joinery, turnery and bookbinding are within their power, and they have been employed in the telephone service, but in all these occupations they are much handicapped by their misfortune. The largest incomes are obtained by those who practice massage and some piano tuners who may get £50 a year, but the other avocations do not average much more than half that amount.

HENRY POWER.

A System of Operative Surgery by Various Authors. Edited by F. F. BURGHARD. Volume IV. London: Henry Frowde, Hodder, and Stoughton. 1909. Price 36s. net per volume (subscribers £6 net per set of four volumes).

This volume of Burghard's *System* includes, among other things, an account of operations upon the eye, the work of Mr. M. S. Mayou, who, in the course of 124 pages, manages to convey in an interesting way the essentials of his subject. The section is well and liberally illustrated.

The opening chapter deals with the general preliminaries to an operation on the eye, the "local" preparation of the patient, and includes considerations

as to the making and healing of surgical wounds in the globe. Then follow description of operations on lens, iris, sclera, cornea and conjunctiva, extra-ocular muscles, eyelids, and lacrymal apparatus, together with a section on enucleation of the eye, and its substitutes, as Mules' and Frost's operations.

We are told by Mr. Mayou that "the patient should be given confidence by talking to him during the operation," sound enough advice when local anæsthetics have alone been used. The author, nevertheless, does not recommend the employment of a mouth veil, which under the circumstances should assuredly be worn by the surgeon. The experiments of Mendes de Léon and others show that the act of talking sprays a wound with particles of saliva projected from the surgeon's mouth, and that such particles are apt to carry with them streptococci, staphylococci, and other micro-organisms. Hence, an operator, whose mouth is often in close proximity to the patient's eye, must either keep silence, or if he speaks (as recommended by Mr. Mayou), should use a mask or mouth-veil.

In describing the construction and arrangement of the operating theatre, Mr. Mayou gives the useful hint that there should be recess beneath the window, in order that the patients face can be brought close to the window, say, on a dark day. As to the window itself, he tells us that it "should consist of a single pane of glass" (so far all is straight sailing) "or of two panes forming the angle of the theatre" (the meaning of which is not quite so plain).

A drastic regimen is prescribed after operations for glaucoma and cataract. Thus, the patient is to be confined to bed for ten days, during the first four of which his head is not to be raised from the pillow. The bowels are to be evacuated "while the patient is in the supine position." This latter injunction, which sounds singularly uncomfortable, would, we fancy, be resented by most individuals, who would assuredly prefer to use the *commode*. Would there really be any harm in allowing them to do so?

It may be fairly questioned whether the dressing recommended by Mr. Mayou after operations on the eye is quite in accord with the teachings and tendency of modern aseptic surgery. Sterilised wool with cyanide gauze, moistened with 1 : 6,000 sublimate, seems rather a step back in these days of dry, non-medicated, sterile gauze. The point, perhaps, is not one of any great consequence. A curious little inconsistency strikes one in speaking of specula. On page 182 a modification of Lang's speculum, which is provided with solid blades to keep the eyelashes away from the field of operation, is spoken of as "perhaps the best." Yet on page 190 a picture of the ordinary, Clarke's, speculum is given, and in none of the illustrations of actual operations does Lang's instrument appear to be used. Since, according to the author, epilation of the cilia is "not practised in this country," it would appear wiser to employ Lang's speculum, modified or otherwise.

Tenotomy by the so-called "open" method is advocated. As regards the other, or subconjunctival, method it is characterised as unsatisfactory, painful, and liable to be followed by troublesome hæmorrhage into Tenon's capsule. Capsulo-muscular advancement is preferred to the other varieties of that operation, and the three-stitch method is selected for description.

Mr. Mayou, as might perhaps be expected, gives some prominence to the newer operations, such as the subconjunctival extraction of cataract, the division of anterior synechiæ, irrigation methods in cataract, extraction of the lens in its capsule, conjunctivoplasty, Maxwell's operation for contracted socket, cyclo-dialysis, sclerotomy, and the operations for ptosis devised by Motais and Fergus respectively. It is, however, surely a blunder to speak of making a hole in the tarsal plate in 'Motais' operation, since the sutures are

passed not through but above the structure in question. We miss any detailed description of Holt's and Herbert's operation for glaucoma.

The author advocates the taking of a culture prior to operation should any discharge be present from the eye.

Mr. Mayou writes so clearly, as a rule, that it may be worth while to point out to him that one does not "perform" a dressing (p. 186), although one may apply a dressing, and that a sentence which may be found on page 185 is almost incomprehensible to an ordinary person ("All instruments should be held lightly in the fingers, which should be, as far as possible, responsible for the fine manipulation required"). The canaliculus knife, Weber pattern, on page 291, is a tremendous-looking weapon, the beak of which resembles a button-hook more than any other object with which we are acquainted. "Streatfield" on page 277 and elsewhere should be "Streatfeild."

NOTES AND ECHOES.

Deaths.

THE death is announced of Andrew James Duncan, surgeon to the Dundee Eye Institution and consulting ophthalmic surgeon to the Dundee Royal Infirmary. His personal estate has been valued at £23,612.

Oscar N. Taylor, instructor of ophthalmology and oto-laryngology at the University of California, and widely known as one of the foremost athletes of the Pacific Coast, died at Lane Hospital, San Francisco, May 23rd, from meningitis, due to an operation which he attempted to perform on himself for the removal of a nasal spur.—*Journal of Ophthalmology and Oto-Laryngology*, July, 1909.

* * *

Appointments.

J. JAMESON EVANS, one of our most valued contributors, has been appointed an editor of the *Birmingham Medical Review*. Dr. Emrys-Jones has been appointed by the Home Secretary to act for a further term of five years as medical referee in all ophthalmic cases for county court circuits Nos. 5, 7, and 8, which comprise most of the large towns in Lancashire and Cheshire. Dr. Matheson Mackay has been appointed honorary assistant ophthalmic surgeon to the Hull Royal Infirmary. Frank S. Owen has been appointed head of the department of ophthalmology and otology at the Douglas County Hospital. George F. Suker has been elected Secretary of the Chicago Medical Society, and H. W. Loeb, Vice-President of the American Academy of Medicine. Röllner and A. Leber, assistants in the first ophthalmological klinik at Berlin, have been recognised as *privat-dozenten* of ophthalmology. Walter Löchlein has been recognised as *privat-dozent* of ophthalmology in Greifsweld. Richard Freund has been recognized as *privat-dozent* of ophthalmology in Berlin, George Lenz in Breslau, and Carlo Palermo in Rome.

* * * *

Honours.

THE title of professor has been bestowed upon Wilhelm Reis, first assistant in Professor Kuhnt's klinik at Bonn, and a similar distinction has been bestowed upon Dr. Chalupecky by the Bohemian University of Prague.

South African Medical Congress.

THE eleventh South African Medical Congress was held at Durban from August 2nd to August 7th last. The *personel* of the Section of Ophthalmology was as follows: President: H. Symonds, M.D. (Lond.), M.R.C.S. (Eng.); Vice-President: Ivar Haslem, Lic. University, Christiania; Hon. Secretary: M. G. Pearson, M.B., B.Sc. (Lond.), F.R.C.S. (Eng.), 281, Moore Road Durban. Mr. A. G. Brinton introduced a discussion upon "Eye symptoms in connection with the diagnosis of general medical and surgical affections."

* * * *

Spectacles superseded!

Mr. STEPHEN SMITH, upon whose vagaries we have commented before (THE OPHTHALMOSCOPE, 1904, p. 493), has apparently broken out in a fresh place if we may judge by the following, published on July 29th last by *The Optical Journal*.

> "We are in receipt of a clipping, which looks like an ad., sent in by a subscriber from St. Louis, Mo., extolling the method practised by Dr. Stephen Smith, of the Battersea Park Hospital, London, England, who is reported to have discovered a "new treatment of the eye which will practically abolish eyeglasses." We note from April 13th, 1905, issue of *The Optical Journal* (five years ago) that Dr. Stephen Smith had just arrived in New York from England with his method. We tried at that time to learn Dr. Smith's method, and we are still interested. Any of our subscribers who have any information on the subject will oblige us by writing us accordingly. It would certainly seem that there should by this time be some definite knowledge on the subject that would be of use to optometrists and opticians."

* * * *

Ophthalmia Neonatorum.

INTEREST in this disastrous disease grows apace. The Central Midwives Board at a meeting on July 22nd, approved the following leaflet, copies of which will be issued in due course to midwives, local supervising authorities, and recognized training schools and teachers:

> INFLAMMATION OF THE EYES IN NEWBORN CHILDREN (OPHTHALMIA NEONATORUM.)
>
> This is a very common cause of hopeless blindness, which is one of the greatest misfortunes that can happen to a child. A very large number of children will be saved from blindness if the following directions of the Central Midwives Board are observed. It generally arises from purulent discharges from the mother getting into the baby's eyes at birth. It is therefore of the greatest importance that this should be prevented: (1) By curing such discharges if possible before labour. This requires medical treatment (Rule E. 19 (2) and (3) as revised). (2) By taking the greatest care that such discharges shall not be carried into the baby's eyes when it opens them for the first time soon after the head is born. The discharges may be carried into the baby's eyes in the following ways: (*a*) The discharges collect round the eyes, especially the eyelashes, and easily get into the eyes. This can be generally prevented if the midwife takes care that "as soon as the child's head is born, and if possible before the eyes are open, its eyelids and the surrounding skin are thoroughly wiped with clean material, such as cotton-wool,

lint, or rag, using separate pieces for each eye." The reason for this is that the piece used for wiping the first eye will be polluted by the discharges, and should not be used for the other eye. (*b*) New-born babies sometimes rub their eyes with their hands. This may rub the discharges into their eyes. As soon as the child is born the hands must therefore be carefully cleansed. (*c*) When the baby is bathed the discharges with which its body is covered during labour are washed off into the bath water. If its face is washed in this water, matter may get into the eyes. N.B.—The above directions are to be observed in *all* cases, whether purulent discharges are known to be present or not.

The following notice has been issued by the Birmingham Health Committee to all the midwives in the city. It is largely based upon the rules recently drafted by the British Medical Association in the Report upon Ophthalmia Neonatorum.

INFLAMMATION OF THE EYES IN YOUNG INFANTS (OPHTHALMIA NEONATORUM).

The above disease accounts for more than 10 per cent. of all cases of blindness, and over one-third of all the cases of blindness in blind schools are due to this disease. If taken in time the disease is curable. Midwives are required to observe the following directions.

I.—*Treatment of Cases presumably Normal as regards danger of Ophthalmia Neonatorum.*

CHILD.—In every case in which a medical practitioner is not in attendance the midwife shall adopt the following routine procedure:

(i) Directly the head is born, and before the eyes are opened, the lids and the surrounding skin should be wiped clean on each side with a separate piece of sterilized wool.

(ii) Nothing should be dropped into the baby's eyes.

(iii) The face and the body should not be washed in the same water. Fresh water should be taken for each.

II.—*Treatment of Cases in which the Mother Suffers from a Purulent Vaginal Discharge.*

(*a*) MOTHER.—If there is a purulent vaginal discharge, whether in pregnancy or labour, medical help must be obtained.

(*b*) CHILD.—If a doctor is not already present when the child is born he should be sent for immediately, in order that any necessary application to the child's eyes may be made.

III.—*Procedure where an Affection of the Child's Eyes is Observed.*

If there is any inflammation of the baby's eyes, however slight, shown by redness, swelling or discharge, the midwife or nurse must explain that the case is one in which the attendance of a registered medical practitioner is required, and medical help must be obtained in accordance with the rules of the Central Midwives Board.

N.B.—Failure on the part of a midwife to act promptly in reporting any case of inflammation of the eyes will be deemed to be a serious offence by the Health Committee.

Notification of Ophthalmia Neonatorum.

MEANWHILE, the borough of Stoke-upon-Trent enjoys the distinction of being the first English municipality to include ophthalmia neonatorum (*i.e.*, "inflammation of the eyes of children under two weeks old as indicated by either redness, swelling, or discharge") amongst the notifiable infectious diseases. The order came into operation but a few days since (28th August), and remains in force for a period of twelve calendar months.

* * * *

Confusion worse confounded.

ACCORDING to Dr. H. Gifford in the *Ophthalmic Record* of July last, a practice has sprung up amongst French and German writers of using the term "sympathize" in a sense exactly opposed to its use in current English. Thus, the first eye is spoken of as *sympathisant* or *das sympathisirende Auge*, and the second eye as *l'œil sympathisé* or *das sympathisirte Auge*. As many of the abstracts and reviews in the United States are by foreigners imperfectly acquainted with English, the word "sympathizing" is being misapplied with increasing frequency. English readers, therefore, should be on their guard against this error. Dr. Gifford claims that if any nation has the right to dictate in this matter it is the British, inasmuch as Mackenzie was the first to assign to sympathetic ophthalmia a perfectly well-recognized place in the science of ophthalmology.

* * * *

Dr. Argyll Robertson's Estate.

THE estate left by Dr. Argyll Robertson, surgeon oculist to the King in Scotland, and consulting ophthalmic surgeon to the Edinburgh Royal Infirmary, has been proved at £30,002.

* * * *

Trachoma.

THE Section of Ophthalmology at the Belfast meeting of the British Medical Association adopted the following somewhat pious resolution with regard to trachoma:

That the Council of the British Medical Association be asked to draw the attention of the Local Government Boards of the United Kingdom to the prevalence of trachoma amongst the lower classes, to the damage to sight which it frequently entails, to the contagious character of the discharge from the eyes of those affected, and to the importance of preventing any transference of such discharge from one person's eyes to another's by means of the washing appliances in the institutions under their control.

* * * *

Senile Cataract.

THE Academy of Sciences of Vienna has voted the sum of eight hundred kronen to Dr. A. Possek for his investigations upon the conservative treatment of senile cataract.

* * * *

Dichotomy.

ATTENTION has already been directed in these columns (April, 1909, p. 306) to an advertisement issued broadcast by Ernest and Co., of 59—61, New Oxford Street, London, W. This screed announces that "Ernest and Co. make such arrangements that persons have their vision tested by an ophthalmic surgeon attached to a recognized hospital and spectacles supplied from 21s. inclusive."

As we pointed out at the time, any medical man who associated himself in this way with a firm of advertising opticians went perilously near the offence known as "covering," and the consequences to him might be very serious if the facts were brought under the notice of the General Medical Council.

The firm in question has now circularized the medical profession at large. In this precious document general practitioners are invited to remit their patients to Ernest and Co., so that each case may be "sent to an ophthalmic surgeon attached to a recognised hospital, and returned to you when fixed up, for your inspection." The practitioner is told that "in the ordinary way your patient may fall into the hands of sight-testing opticians, many of whom are totally incompetent and unscrupulous," a bit of plain speaking that we fancy will be resented by our friends the enemy! The proposition is characterised by Ernest and Co. as "the half-way house between a consultant at two guineas and a charitable institution." The proposal is rendered clear by the following letter received from Ernest and Co. in response to enquiries addressed to that firm by a Northern correspondent :—

Dear Sir,

In reply to your letter of 13th inst., our *modus operandi* is as follows :

We are wholesale opticians and under no circumstances do we do sight-testing ourselves, every case is sent to an ophthalmic surgeon who may be selected by the patient if they so wish. We, however, make arrangements with certain ophthalmic surgeons to test our patrons at a given fee, which fee we pay (not the patient). The patient pays us a fee which includes the surgeon's consultation and the glasses to his prescription.

In no sense are we associated with any surgeon, our attitude being merely that of an insurance company towards its medical referees.

Yours faithfully,

ERNEST AND CO.

* * * *

THE
OPHTHALMOSCOPE.
A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. VII.—No. 10.] *OCTOBER 1, 1909.* [TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

THE RELIEF OF EYE DISEASE IN EGYPT, WITH SOME CONSIDERATION OF THE INCIDENCE OF BLINDNESS AND TRACHOMA.*

BY

A. F. MacCallan, M.B., B.C., Camb., F.R.C.S., Eng.

CHIEF INSPECTOR OF OPHTHALMIC HOSPITALS IN EGYPT.

Egypt has been well-called the classic home of trachoma, the land of eye sufferers and the blind.

Trachoma.—Trachoma is practically universal among the middle and the poorer classes, as is instanced by my examination of the pupils of one of the Government Primary Schools, that of Tanta, the chief town of Gharbieh, the largest and most important province of Egypt, in May, 1909, where I found that 96·43 per cent. were affected with this form of conjunctivitis. To show that the sequelæ of the disease are not escaped, I may remark that out of 18,239 patients examined at three ophthalmic hospitals during the year 1908, 6,439 were cases of ingrowing eyelashes (trichiasis or entropion), practically in every case the result of trachoma.

Blindness.—As regards blindness, the census for 1907 shows that more than half a million persons are blind in one or both eyes.

Total enumerated population 11,189,978.

Blind in one eye 363,702 or 3.25 per cent.

Blind in both eyes 148,280 or 1.32 per cent.

Total number of blind 511,982 or 4.57 per cent.

These figures must be taken with the greatest reserve, for, as stated by the Director General of the Census, "Proposals have frequently been made to collect such data in European countries, but after consideration have, I believe, been almost invariably rejected, on the ground that the reticence which naturally exists to delare personal infirmities or infirmities of relations, would make the returns entirely valueless. If these objections are well-founded in countries where the standard of education is very much higher, and the prevalence of prejudice much less than in Egypt, they are emphasised in the case of the present statistics.

It is therefore probable, that the above figures are too low and that the percentages should rather approximate to those obtained at the hospitals over which I have control. During the last three years we have examined 84,133 patients, of whom 7.3 were found to be blind in one or both eyes. The amount of monocular blindness was 4·69 per cent. and of binocular blindness 2·61 per cent. The actual numbers are here given.

	Total No. of patients examined	Monocular		Binocular		Monocular and Binocular	
		No. of cases	Per cent.	No. of cases	Per cent.	No. of cases	Per cent.
1906	40,103	1,297	3·2	663	1·6	1,960	4·9
1907	24,416	1,450	5·9	697	2·8	2,147	8·7
1908	19,614	1,189	6·06	852	4·34	2,041	10·4
Total	84,133	3,936	4·69	2,212	2·61	6,148	7·3

*A communication made at the XVI International Medical Congress, Buda Pesth, September, 1909.

These percentages applied to the enumerated population of Egypt would give :—

Blind in one eye	524,810
Blind in both eyes	292,058
Total number of blind	816,868

It is obvious that percentages obtained from hospital statistics applied to the general population of most countries may well be criticised as very much too high, but in Egypt where 96 per cent. of the population suffer from trachoma, and where acute ophthalmias are seasonally rife, it is probable that they are very little, if at all, too high.

The idea of there being a quarter of a million persons in Egypt blind in both eyes is striking ; it is about the same number as that of the inhabitants of Tanta and its environs. Even if the census figure 148,280 be taken as correct, it is greater than the population of Assiout (the most important town of Upper Egypt) and its environs.

The only data I have for purposes of comparison from a western country are obtained from the census figures of 1900 in the United States of America, where the cases of blindness in one or both eyes number 85·2 per 100,000 of population as compared with 4,650 in Egypt. The coloured population of Idaho, the State most affected with blindness in U.S.A., has 590 per 100,000 blind in one or both eyes.

Egypt is therefore nine times as much affected with blindness as the coloured population of the most affected state and fifty-five times as much as the average in the United States.

	Egypt.	U.S.A.	U.S.A. Coloured population in most affected State—Idaho.
Average per 100,000.			
Blind in one eye ...	3,320	38	302
Blind in both eyes ...	1,330	46	288
Total blind	4,650	85	590

Prevalency of Ophthalmia.—It is the custom to say at the present time that blindness and acute ophthalmias are much less prevalent than they were fifteen years ago, but in the face of the statistics and estimates I have given above, it is difficult to believe that conditions can ever have been much worse than they are at the present time.

The actual amount of ophthalmia (using this word as a generic term for all diseases of the conjunctiva) is, in all probability, as great as it ever was.

The reason fewer severe cases are noted now than formerly may be because there actually is less acute disease in the country, or because owing to changed conditions, the European has less opportunity of noting the severer cases.

Reasons for the diminution of acute forms of ophthalmia are somewhat difficult to find. It cannot be attributed to any wide-spread measures of sanitary reform, for as Lord Cromer* says "Sanitary reform has of course progressed less rapidly than improvements in the medical service. In the former case, the conservative instincts of the people, and their indifferences to sanitation, constitute an almost insuperable barrier to rapid progress."

The increase in the general prosperity of the mass of the Egyptians has not had as yet much real influence on their personal hygiene or mode of life.

In former times the European quarter of Cairo and of the other large towns was not differentiated from the native quarters as it now is, and travellers and others came more into contact with native life and had more opportunity of seeing people in the streets suffering from eye disease.

Both in Cairo and the tourist resorts there has been in recent years an effort to prevent the former all-pervading demand for "backsheesh" by beggars, many of whom exhibited their mutilations and diseases for the purpose of exciting the pity of the charitable. Amongst these beggars were many with discharging eyes, now seen no more as the result of the efforts of the police.

It may thus be that the diminution of acute forms of ophthalmia is more apparent than real.

If the improvement is real it can only be in the acute forms of ophthalmia, for the chronic forms are just as prevalent as they have ever been, as instanced by 96 per cent. of trachoma at Tanta School. It has been suggested that this is due to a diminution of the virulence of the various organisms which cause purulent ophthalmia, an explanation not based on any evidence with which I am acquainted, although not necessarily to be rejected on that account.

The extraordinary density of the population in Egypt, 939 per square mile, greater than that of any European country (of which the most densely populated is Belgium with 588 per square mile), and only outdistanced by Bengal, is, and will always be, a barrier to the diminution of contagious ophthalmias

Ophthalmic Hospitals in Egpyt.—I came out to Egypt in 1903 at the request of the Egyptian Government, to organize and administer a travelling ophthalmic hospital and to train in ophthalmic surgery Egyptian surgeons attached to it. This hospital was maintained by the generosity of Sir Ernest Cassell, and was subsequently increased by the addition of a similar hospital, both under my general superintendence. These hospitals were organized somewhat on the lines of the pre-existing "ophthalmic flying columns" founded by Professor Belljarminow, which have done such exceedingly useful work in Russia. Each hospital consists of ten or twelve large Indian tents containing all the necessaries in the way of equipment and a complete set of ophthalmic instruments.

The staff consists of two Egyptian surgeons at each hospital working under my supervision, together with hospital attendants, servants, etc.

Ten or twelve in-patients are provided for, but the large majority of those who seek relief (including all trichiasis cases operated on) are treated as out-patients Very little reliance is placed on home-treatment by the patients themselves, and the large majority, 200 or 300 a day, attend daily until relieved or cured. Clinical work is carried on summer and winter for five or six hours daily, the rest of the day being employed in preparation for the next day's work.

Full clinical notes of every patient treated at the hospitals are kept.

Each camping ground is occupied for a period of about six months, at the end of which time work is transferred to some other place. This is not because, even after prolonged stay in a place, there is any diminution in the number of people applying for treatment, but because we consider it only just to give different provinces the benefit of ophthalmic treatment by the travelling hospital.

There was some doubt at the inception of the scheme as to its probable success, and as to the readiness of the fellahin to take advantage of it. All doubt was, however, soon set at rest by its immediate and complete success. There never was the smallest hesitation on the part of the people to visit the hospital for treatment, nor to submit themselves to whatever operation was advised. All patients are treated free of charge, and are given lotions, etc., when necessary, for use at home. By far the larger number of the patients have every appearance of poverty.

As an instance of the amount of work done, I may say that on June 12th,

1907, at Damanhour, the number of new patients treated was 45, the number of old patients was 412, and the number of incurable cases was 18. Sixty-five patients on this day applying for treatment were deferred owing to lack of time to treat them efficiently.

It is, indeed, by means of these travelling hospitals that interest in the means of affording ophthalmic relief has been aroused in the country; that more than £10,000 has been privately subscribed by the public for building purposes; and that the Government has been induced to spend £15,000 on building hospitals, and is giving at the present time more than £5,000 a year for their maintenance.

Three permanent hospitals are either built, or are in the course of construction, as well as the two travelling hospitals. All these are under my charge and are staffed by Egyptian surgeons whom I have trained.

My pupils and I have obtained a much clearer idea of the phases of the principal disease against which we have to contend in Egypt, namely, trachoma, since I adopted a system of classification of these phases.

Trachoma is a condition of the mucous membrane of the eyelids, in which gross changes occur, resulting in the formation of so-called granulations (with or without a papillary hypertrophy), which in favourable cases disappear, and are replaced by connective tissue. My classification of four stages is based on the comparative prominence of the three features—granulations, papillary hypertrophy, and connective tissue formation.

Trachoma I is the beginning of the disease, and trachoma IV is its end, when a cure has resulted (either naturally or by treatment).

Trachoma I is well described by Hourmouziadès: "One finds on the conjunctiva of the tarsus and of the superior *cul-de-sac*, especially at the two extremities of the tarsus, slight roughnesses, forming greyish or greyish-yellow islands, which are semi-transparent and almost avascular, with small blood-vessels converging towards them. These roughnesses generally resemble grains of sago. There may or may not be a mucous discharge."

This simple form lasts a variable time, sometimes as long as a year, but after the development to a certain degree of the granulations, the conjunctiva becomes more vulnerable, and complications with species of conjunctivitis other than trachoma usually occur.

This form may pass into trachoma II or, in favourable cases, or cases which have been treated, into trachoma III or IV.

Trachoma II is the stage in which granulations are numerous and large, or in which a papillary hypertrophy is present. It may be divided in the above sense into trachoma IIa and trachoma IIb.

Trachoma IIa. Gelatinous granules are present all over the tarsi and in the upper fornix. In some cases the individual granulations can no longer be distinguished, as they fuse into tumour-like masses or merge into a general infiltration, the tissue assuming a peculiar glassy gelatinous appearance.

Trachoma IIb. There is formation and hypertrophy of pseudo-papillæ consisting in red raspberry-like elevations which mask more or less the typical gelatinous granules. This papillary form, as it is called, is especially marked on the upper tarsus. It may easily be mistaken for spring catarrh and for a condition occurring as the result of any long-continued irritation or of a protracted attack of purulent ophthalmia in non-trachomatous eyes.

Trachoma III. In this stage cicatrization has definitely begun, and is more or less advanced. Islands of inflamed conjunctiva or of trachomatous granules are seen to be surrounded by a network of fine lines of connective tissue. It is in this stage that necrosis often results from the pressure of the

shrinking connective tissue (post-trachomatous degeneration). The necrotic tissue may become calcareous. The cicatrization which is typical of this stage is generally supposed to be pathognomonic of trachoma; this statement, however, is not strictly true.

Trachoma IV is a condition in which there is a smooth conjunctiva, seamed by white lines of connective tissue. This is the stage of practically complete cicatrisation of the conjunctiva or of cured trachoma.

I am aware that there are many cases which cannot be definitely stated to belong to one or other category—for instance, a case may be between trachoma II and trachoma III, or between trachoma III and trachoma IV, but it is my experience that for teaching purposes this division of trachoma is a valuable means of differentiating between its various phases.

TRANSIENT CONVULSIONS IN TWO CHILDREN WITH UNUSUAL CHANGES IN THE FUNDUS OCULI.

BY

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THE following two cases were under observation at the same time in the wards of Dr. John M. Cowan in the Glasgow Royal Infirmary, and they resembled each other closely enough to make it seem desirable to report them together.

CASE I was in a girl, aged 13½ years, admitted on November 23rd, 1907. She was pale and thin, but intelligent. There was no history of previous ill-health with the exception of measles in infancy. She had had headaches for a year or two, but a week before admission, these became more noticeable, and were accompanied by swelling of the eyelids and face. Pains in the legs and throat, extension of swelling to the abdomen, and vomiting, succeeded at intervals of a few days. Her doctor said the kidneys were affected. At 2 a.m. on the day of admission she took several convulsions, each of about 15 minutes' duration, and at intervals of half-an-hour. These were followed by a state of drowsiness, and micturition was scanty and infrequent. Her family history contained nothing of importance. Urine, on admission, was acid, spec. gravity 1030, distinct albumen, reaction for blood, no sugar, no indican. The pulse was 132. The temperature was slightly elevated (101°F.) but fell to normal the following day. The tonsils were greatly enlarged and acutely inflamed. There was evidence of distinct dilatation of the left ventricle and a short systolic murmur was heard at the apex, running out of the first sound. The first fit observed after admission began with clonic spasms of the left leg, left sterno-mastoid, and left side of the face; conjugate deviation of the eyes and nystagmoid movements occurred, and the pupils were moderately contracted and fixed. Later, the left arm was affected. After an interval of about a minute, in which the patient seemed to be unconscious, the right side became involved, with conjugate deviation of the eyes to the right. The movements began in the leg and worked up until the whole body became affected. The whole fit lasted about 12 minutes, and was succeeded by drowsiness. In succeeding fits there was no constancy of the part first affected and their duration varied from four to fifteen minutes. In the next 24 hours the number of fits diminished, pulse-rate and temperature were less, output of urine was increased, but there was Cheyne-Stokes breathing, and the left ventricle was still greatly dilated. The subsequent history was one of steady improvement. The convulsions ceased after the second day and about the same time œdema disappeared. Albumen and blood disappeared from the urine in about four weeks. Tube-casts were never found in the urine. There was very gradual return of the heart to its normal size. The systolic murmurs heard from time to time were probably functional. Blood pressure throughout was somewhat high for a child of her age.

Patient was dismissed on 26th February, 1908, after 13½ weeks' residence in hospital.

Ophthalmoscopic Examination.—The optic disc was rather pale, and the retinal vessels, especially the arteries, were somewhat narrow. Dotted over the fundus were a number (6 or 8) of small, irregularly-shaped masses of black pigment, some of them obviously retinal in position, as they were superficial to the retinal vessels. At the extreme periphery of the fundus there were a number of pale spots, apparently due to partial choroidal atrophy. None of these changes was at all striking, but the attention was more readily attracted

by the condition of the veins. Most of the main branches were accompanied by white lines, which commenced faintly near the disc, and soon becoming more distinct, could be traced far out into the periphery of the fundus. The veins showed no local constrictions or other changes in their walls, and the arteries, beyond the slight narrowing already noticed, were normal. These changes remained unaltered as long as the patient was under observation. The conditions described were found in both eyes. As regards the pathology of the fundus changes in this case, there had evidently been a choroido-retinitis of moderate degree, leaving behind it the pigmentary and atrophic changes described. I think one is justified in describing the venous changes as a *periphlebitis*. Our knowledge of the histology of such conditions is incomplete, owing to the infrequency with which the vascular lesions observed during life can be afterwards submitted to microscopic examination. It seems likely that there had here been a cellular deposit in the perivascular lymph spaces or else a proliferation of the adventitia. Such deposits are prone to degenerative changes, such as hyaline degeneration, and it is probable that the white lines first become visible when such degeneration has occurred. There is no reason to believe that the vascular change differs in date or in origin from the retinal and choroidal lesions.

Such an extensive periphlebitis without any corresponding arterial changes must be extremely uncommon, and I have been unable to find any illustration of the condition. In three cases figured in Wecker and Jaeger's *Maladies du Fond de l'Œil*, white lines are shown accompanying the veins, but in all three there is atrophy of the optic nerve and retina, the white lines are seen on the arteries also, and on the veins they are broader near the disc and diminish as we go towards the periphery. In the present case it is notable that the white lines were absent from the immediate neighbourhood of the disc, and that they were found on the veins as far out as these could be traced by the ophthalmoscope. These facts, together with the absence of any changes in the arteries, seem to point to some toxic products of the retinal inflammation as the cause of the change in the efferent vessels.

The ætiology of the condition is still more obscure. The renal disease being of an acute character, could not have been the cause of retinal changes obviously of some standing. It is not impossible, however, that the patient's symptoms, and the retino-choroidal changes, may have been attributable to one and the same root-cause. Although there were no stigmata of inherited syphilis, and nothing in the family history definitely indicating a specific inheritance, one is inclined to look upon the fundus condition as a manifestation of inherited syphilis.

A paper by W. T. Holmes Spicer on "Retinal Vasculitis in Inherited Syphilis" (*Trans. Oph. Soc. U.K.*, 1892, Vol. XII) seems to bear on the present case. He says that in these cases the ophthalmoscopic appearances vary according to the severity and the degree of involvement of the retinal vessels. In the slighter forms the veins are bordered by a thin, delicate, grey-white line on each side, which first shows itself near the optic disc, and gradually grows in thickness and density as the vessels pass away from the disc to the periphery. As a rule, the lines are not so well-marked in the larger as in the smaller vessels. In such cases the arteries show the changes much less than the veins. In others the arteries are affected equally with the veins. In most cases there is widespread disturbance of retinal and superficial choroidal pigment, sometimes a little like retinitis pigmentosa in the fact of the pigment being retinal.

The general applicability of this description to the case under discussion will be noticed, but in our case the arteries were entirely unaffected and the

condition was, contrary to Spicer's finding, confined to the larger veins. Moreover, from the description of his cases it would seem that the choroidal involvement was in them a more marked feature. Curiously enough, his microscopic examination led him to conclude that the deposit in the vessel wall was chiefly subendothelial, although there was also some perivascular thickening. The retinal condition indicated that there had been a widespread diffuse retinitis.

Case II. was in a boy, aged 12, admitted on March 12th, 1908. He was a bright, healthy-looking lad, fairly well grown for his age. His only previous illnesses were measles and whooping cough, and his family history was good, without any evidence of syphilis. There was no consanguinity of his parents. Eight days before admission he returned from school complaining of a dull soreness in his thighs. He became somewhat drowsy and four days later rather restless. Swelling appeared below the eyes and in the abdomen. He had frequent vomiting and diarrhœa the day before admission, and on the day of admission took three convulsions, the first at 12.10 p.m., lasting five minutes, one at 6.30 p.m., lasting 20 minutes, and one at 7.30 p.m., in the course of which he was brought to hospital. The third fit was succeeded by unconsciousness. The movements were said to have started in the left thumb, passed into the left arm and face and then become general. During the twenty-four hours before admission the quantity of urine passed seems to have been scanty, and a trace of albumen had been found in it. This was confirmed after admission, but no casts were found, and there was no blood.

On admission, there was still slight general œdema, and the temperature was 99.6°F. Pulse 92. The breath was foul. No motor or sensory disturbance was made out. He was not anæmic. The area of cardiac dulness was enlarged, and a soft systolic murmur was audible in the pulmonic area. The superficial vessels were not abnormal. The blood-pressure was about normal in height.

He had two convulsions the day after admission, and one (the last) on the following day. The œdema disappeared in about four days, the output of urine increased, he became brighter, and in two or three weeks the size of the heart had returned to the normal. A trace of albumen persisted.

Ophthalmoscopic Examination.—The left eye was normal. In the right eye a large number of white spots were seen scattered over the upper part of the fundus. A few small ones were visible near the disc, but they were found in much greater numbers and of much larger size at a distance of 5 or 6 disc-breadths above the disc, and extending from that point in an irregular line inwards and upwards, and outwards and downwards. The farthest limit to which they reached in the horizontal meridian could not be traced. The spots varied in size from mere pin points to dots with an apparent diameter, as seen in the erect image, of $\frac{1}{8}$ inch. Their shape was irregularly rounded, some of the larger ones having evidently resulted from the confluence of smaller ones. They had a bright, pure-white colour, almost glistening in appearance. There was no pigment disturbance in their neighbourhood. Their situation was in the retina, some of them deeper than the retinal vessels, but some superficial to the latter in the nerve-fibre layer.

Very far out in the upper temporal region of the fundus, the retina showed a greyish, opaque appearance, with one or two whitish streaks running through it. The veins at this part were bordered with white lines, and one or two dark-red, oval bodies, which were difficult to make out, but which looked like globular dilatations of the veins. One or two arteries in the same region also showed perivascular lines.

Vision was perfect in both eyes, and the field of vision in the right eye normal or only very slightly contracted. All the other functions of the eyes were normal, and there was no history of night-blindness. There was no variation of the conditions observed while the patient remained under observation.

In looking for an explanation of these changes I have been unable to trace any similar case in the literature.

The superficial situation of the spots enables us at the outset to exclude choroidal changes, and more especially the colloid outgrowths of the lamina of Bruch, which at a first glance they resembled. Other points of difference were the brilliant white colour and the absence of the fine pigment border usually seen defining such outgrowths.

The changes being retinal, can we associate them with any of the recognised forms of retinitis?

Albuminuric retinitis naturally suggests itself in view of the existence of albuminuria. It must be admitted that in appearance the spots were more like those of the albuminuric "macular star" than any others with which one is familiar, and it is very probable that they would present a similar appearance under the microscope, but in grouping and in distribution they were entirely different; and even making allowance for the great variability of albuminuric retinitis, such a picture would be entirely atypical. Moreover, the albuminuria was, after all, of a trifling character, and there was no evidence of chronic kidney disease.

A consideration of the history and details of the case enables one to exclude retinitis punctata albescens, retinitis circinata, and all other forms of retinitis. The changes more closely resembled those in certain unexplained cases described and figured by Batten, Holthouse, Bickerton, and Blair in the *Transactions of the Ophthalmological Society*, Vols XVII, XX, and XXI. In none of these, however, was any condition present corresponding with that found in the extreme periphery of the fundus in the case under review. That condition indicated that at some past time there had been a retinitis with perivasculitis leading to an atrophic and cicatricial condition of the retina and to further vascular changes. In the absence of evidence to the contrary, one must assume that the white spots originated at the same time, that they are of a degenerative character, and are further evidence of a past retinitis. What the ætiology of the retinitis was one cannot say. There was even less reason for a diagnosis of inherited syphilis in this case than in that of the girl first described. As in that case so in this the question arises whether the existence of corresponding changes in the nervous system and elsewhere might account for the symptoms for which he was admitted to hospital.

I am indebted to Dr. Cowan and to his house-physician, Dr. Storey, for permission to use their clinical reports on these cases.

CLINICAL MEMORANDA.

A NOTE ON ALYPIN.

BY

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ENCOURAGED thereto by the reading of favourable reviews on the action of alypin, we determined to give it a trial in the Government Ophthalmic Hospital, Madras. A sample of the drug was obtained fresh from Europe (Bayer & Co., Elberfeld).

It was first tried on a cataract operation morning. We had 19 extractions to do that morning (August 14th, 1909). The drug was (as recommended by Mr. Sydney Stephenson) made up in a 2 per cent. solution by the chief assistant of the Hospital, so that there can be no doubt as to the accuracy of the preparation. The usual routine on extraction mornings is for the second assistant to give each patient five instillations of 4 per cent. cocaine solution

in the course of twenty minutes. The cases are then ready for the table, and it is a very rare circumstance for a patient to complain of any pain whatever during the operation. The first case on the table was a Hindu female with an uncomplicated cortico-nuclear cataract. The operation was performed under great difficulties; the patient made violent movements and her whole body quivered with pain. During the sections of the cornea and iris, she squealed like a rabbit in a gin. She was so thoroughly restless that it was deemed inadvisable to proceed with irrigation, and some cortex seen in the chamber was left there rather than risk a disaster. Such a thing is very rare indeed in our practice, where the patients seem unconscious of the irrigation. Moreover, there was a fairly free hæmorrhage into the chamber during the operation.

The nervous temperament of the patient was blamed for the result, until after the second case had been operated on. This was a case of immature cataract in a male Mahomedan, *æt.* 75. Once again, the violent movements of the patient made the operation most difficult, and, again, free hæmorrhage took place both after the corneal and after the iris section. This second departure from the even current of our cataract mornings made it clear that the eyes were not thoroughly anæsthetised.

The third case was a Hindu female, *æt.* 40. The usual final cocaine instillation was substituted for the last alypin drops. Again, the notes contain the expressions so uncommon in our records, "patient very troublesome," "great difficulty throughout operation," "a quantity of cortex left in chamber," and the explanatory note "the patient was evidently not anæsthetised." Again, free hæmorrhage into the chamber was observed. It only remains to add that the case was an uncomplicated one of cortico-nuclear cataract.

In consequence, the fourth case was given cocaine for the last two instillations; she had already had three instillations of alypin solution. The patient was a Hindu female, *æt.* 70. She made a sudden movement during section causing the knife to impale the iris and leading thereby to an iridodialysis with consequent hæmorrhage into the chamber, a very rare accident in our practice in Madras. She was, however, decidedly quieter than the three previous cases, although far from a normal cataract operation patient in her behaviour.

The fifth and last case had had one instillation of alypin before its use had been countermanded. She was a Hindu female, *æt.* 60, and the cataract was a straightforward Morgagnian one. Again there was hæmorrhage, and once again the notes read "patient very troublesome," "free hæmorrhage after corneal section," "a very unmanageable patient."

Such a series of unusual and untoward incidents had disturbed my equanimity not a little, and the alypin solution was definitely laid aside, the usual cocaine drops being substituted. From the sixth case on to the last (nineteenth case of the morning) the usual smooth running of an operation morning was resumed. The patients lay passive and apparently unconscious of what was going on, and the wear and tear on one's nerves of the first five operations was soon forgotten. Dr. (Miss) Campbell, who happened to be present at the operations, was as much struck with the change wrought in the course of the operations as I was.

We have subsequently tried the same solution of alypin for the removal of four pterygia in one morning, and for other operations on the surface of the eye. Complete anæsthesia was apparently obtained, but in nearly every case the hæmorrhage was more troublesome than is usual with cocaine operations (adrenalin solution being used in both). The claim that the pupil is not dilated by the action of the drug was certainly not maintained, although the

amount of dilatation was certainly rather less than one is used to see in cocainised cases.

Whilst bearing carefully in mind that the unsatisfactory results above recorded may be due to some factor which we have failed to detect or to exclude, the conviction is borne forcibly in on us that it is not well to discard lightly so reliable, cheap, and (taking everything into consideration) satisfactory a drug as cocaine has always proved itself in this Hospital.

A FATALITY FOLLOWING DISCISSION.

BY

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Nora F., aged 13 years, was admitted to the Leeds General Infirmary, on August 9th, 1909, under the care of Mr. H. Secker Walker.

She had lenticular opacities in both eyes. R.V 6/18. The lenticular opacity in the right eye was central and not well-defined. The left lens was entirely opaque, no clear margin being evident at the equator. The fundus was not visible through the opacity, which appeared of uniform density and whiteness. Light perception was good. In other respects the external appearances presented by both eyes were perfectly normal.

The child was very thin, and it was noticed that her skin was dry and rough. There was a marked malar flush, which varied in intensity from time to time. Her voice was harsh and rather high-pitched. Her whole appearance gave the impression of listlessness. These points, together with a history of voracious appetite and thirst, were enough to suggest a diagnosis of glycosuria.

It was thought, however, that as far as a trifling operation such as "needling" was concerned, this diagnosis could not be of great importance. A specimen of urine was not obtained for examination before operation.

Soon after admission, the child was put on a mydriatic—atropine sulphate 1 per cent., one drop thrice daily in the left eye. She was not kept in bed, and diet was not restricted until after the operation.

At 3 p.m. on August 11th the left lens was "needled" with two fine needles, under cocaine anæsthesia—one drop of a 5 per cent. solution being instilled every five minutes for half an hour. The eye was padded and the patient sent to bed.

Prior to operation she had been waiting for an hour or more in the anteroom of the theatre. The Sister-in-charge reported that the child asked twice for water. She was, however, quiet, and betrayed no signs of excitement or nervousness. When her turn came, she was still quite calm and allowed her eye to be douched and the discission to be performed without any difficulty. The malar flush was very noticeable.

Nothing abnormal was reported until the evening of August 12th. There was no frequency of micturition and no constipation.

At 9.30 p.m. the night nurse on her first round noticed the child sitting up in bed; she complained of pain in the epigastric region; there was neither headache, sickness, nor dyspnœa. Temperature was 97.8°F. Pulse 108. Respirations 18. At 10 p.m. she was apparently asleep and breathing comfortably. It was not until about 11 p.m. that symptoms of collapse became evident. She was again sitting up in bed, the right pupil was dilated, the

limbs were cold, the deep and laboured inspirations were typical of air hunger. Temperature was 96.7°F. Pulse 166. Respirations 20. There was no complaint now of abdominal uneasiness, only a demand for more air.

Stimulant treatment was at once commenced, strychnine and digitalis four-hourly, oxygen and brandy at frequent intervals. The nurse was instructed to allow her to drink large quantities of water made alkaline with sodium bicarbonate (half a drachm to the tumblerful). At midnight she was very restless, and as the "special" nurse, who was then looking after her, reported that the other patients were being kept awake, the child was removed to an adjoining private ward. The pulse-rate was still higher.

The delirium, which was at its height between 1 and 2 a.m., gradually gave way to coma; occasional twitching of left upper limb was noticed. There was no cyanosis. Examination of the lungs shewed only harsh prolonged inspirations.

At 4 a.m., infusion of normal saline was resorted to into the median basilic vein of the right upper arm, and subcutaneously into the outer side of both thighs. The coma, however, deepened, and terminated in death at 7 a.m., August 13th.

Autopsy.—The post-mortem examination was performed by Dr. Watson. The stomach was markedly dilated, and it bulged forwards as soon as the abdomen was opened.

The glands in the mesentery were enlarged, and two or three were caseating. The kidneys were congested. The condition of the bladder was interesting. Its walls were not abnormally hypertrophied, but the viscus was very contracted and contained only a few drops of urine, which slowly reduced Fehling's solution. The test for acetone was positive. The sweetish odour of the blood was unmistakeable. The right heart was filled with post-mortem clot; the pulmonary arteries contained no thrombi, and there were no signs of fat embolism. The other organs were all examined and found macroscopically normal. There was no phthisis. On the skin of the abdomen several pale areas were noticed—roughly about an inch in diameter—presenting the appearance of atrophic patches—situated below the umbilicus and towards the right side.

The lens of the right eye was removed and examined microscopically by Dr. Grüner. The centre stained badly and showed signs of degeneration—breaking up of the lens-fibres into irregular masses with granular *débris* in the interstices. There was an irregular proliferation of the cells of the anterior capsule.

The anterior chamber of the left eye was filled with broken up soft lens matter.

My thanks are due to Mr. H. Secker Walker for his permission to record the notes of the case.

A SPONTANEOUS SEROUS CYST FLOATING FREE IN THE ANTERIOR CHAMBER.

BY

J. N. Roy, M.D.,

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Case-Report.

On the 6th of December, 1905, Miss L. C——, 21 years, came to the ophthalmological clinic at the Hôtel-Dieu. She complained of ocular fatigue at her work, dress-making, and called attention especially to her right eye, which was weaker than the left.

Present Condition.—Examination of the left eye in oblique light showed a slight pannus on the superior part of the cornea. Save for certain granulations in the *cul-de-sac* of the upper lid, the rest of the eye and its adnexæ were perfectly normal.

More interesting was the condition found in the right eye. The first striking observation was the presence of a small cyst in the anterior chamber. The tumour was not perfectly round, but rather flattened in the antero-posterior direction, and measured about two and a half millimetres in its widest by one and a half in its narrowest diameter. It was transparent, and a careful examination with Hartnack's glass allowed us to see that its capsule was greyish, dotted with pigmented spots, and traversed by small muscular fibres in the form of brown ramifications. The most remarkable feature in the case, which is perhaps unique, was that the cyst had no pedicle, but was entirely free in the anterior chamber. In fact, if the head of the patient was thrown forward quickly, the cyst could be seen to move upwards. The examination of the cornea showed small opacities, as well as a slight pannus. The posterior part of that membrane was transparent and had undergone no change from its contact with the cyst. No trace of traumatism or of perforation was present. The fluid of the anterior chamber was clear, and the iris was of the same brown color as that of the left eye. The iris bore well the frictions of the cyst wall, and showed no inflammatory reaction. Contraction to light was normal, and there were no synechiæ. Dilitation was normal, and was not influenced by any reflex irritation. No pupillary membrane was present. The lens was perfectly transparent and the anterior lens-capsule had no pigmented areas.

After instillation of homatropine and cocaine, the fundus of the eye was examined and found normal. Ocular tension was not increased. Examination of the upper lid showed a slight trachomatous infection.

The refraction gave the following result:—

R.E. + 3·75 V. 1 3
L.E. − 0·50 V. 1

Perception of color in both eyes was perfectly normal, as well as the fields of vision and the accommodation. There was no muscular asthenopia.

Personal History.—The patient said that one morning in January, 1898, she had noticed for the first time the presence of a small tumour in the right eye. The cyst caused no pain, and nothing else was noticed on that day any more than previously. Since that time it had not increased in size, and had always preserved the same shape. The patient had not been incommoded by any inflammatory lesion caused by the tumour. She complained that on resuming the upright position after having bent her head forward, her right field of vision was obscured during the space of a few seconds. No history

of ocular trauma was obtained. The patient was not the subject of any diathesis and enjoyed excellent health; the only illness she had had was smallpox at the age of four. It was as a result of this illness that the right cornea was affected, following which the slight opacities remained. These opacities of the cornea amply explained the vision of 1/3. As to the trachomatous lesion, she had never suffered therefrom and could give no explanation of it; she was even surprised when we gave her hygienic advice regarding it. There was no history of intestinal worms. Her hereditary antecedents showed nothing of interest, nor could anything bearing on her case be elicited.

The diagnosis of spontaneous serous cyst was made, for it was evident that we had not to deal with the sac of a cysticercus or any solid tumour. Energetic treatment for the granular conjunctivitis was proposed, for the purpose of preparing her for a removal of the cyst. Not only did she refuse operation, but even medical treatment, and she returned to her home with an order for glasses. On her return, sometime later, she reported that she was well, and perfectly satisfied with her glasses.

Comments.

We have thought this communication interesting, because we have not found similar cases in medical literature. Unhappily, the observation is not as complete as we could have wished, since there was no microscopic examination of the cyst, in consequence of the refusal of the patient to allow operation. In view of the history of the condition, the cyst having suddenly appeared in the anterior chamber, we may be allowed to put forward a hypothesis to explain its presence in that situation. It is not the intention, however, to make a long dissertation to support or to refute the different theories of the formation of cysts of the iris.

Schmidt-Rimpler believes that most frequently they are formed by a crypt whose opening is obliterated and whose cavity is filled by a liquid similar to the aqueous humor. Mackenzie and Bowman think that they arise from the presence of a fluid secreted between the muscular coat of the iris and its posterior epithelium. According to de Wecker, these tumours are the result of a simple infolding or saccular deformity of the iris.

In our case, it should not be forgotten that we have here a spontaneous cyst, for there is no history of traumatism. It has assuredly developed in the posterior chamber, either upon the ciliary body or on the posterior surface of the iris. Treacher Collins has published observations, with microscopic examinations, of spontaneous serous cysts, adherent, which have developed on the posterior surface underneath the normal pigmented layers of the iris.

It is to-day admitted that the lining membrane of these cysts is not always composed of epithelium. In fact, the researches of Ch. Robin upon the subject show that sometimes the wall of a cyst of the iris does not possess epithelium, but only a material composed of fine fatty granules with a small number of pigmented cells. According to the same author, the wall is formed by the tissue of the iris which seems to be doubled upon itself to give origin to a cavity. This opinion is also shared by Bowman.

In our patient if this cyst has developed as have those reported by our English colleague, if it has formed itself at the expense of the ciliary body or even of the posterior part of the iris, according to one theory, it is not the less true that it has had at some time a pedicle. This must have been filiform; and eight years ago, under the influence of some cause, which cannot be determined, it broke away from its point of attachment. Once free, the

cyst being squeezed in the posterior chamber, has naturally passed into the anterior chamber by the pupil. Very careful examination shows its anterior wall to be a little less convex than its posterior, and leads us to suppose that the pedicle was upon the posterior surface. The cyst, during the eight years it has lain in the anterior chamber, has preserved its consistence by the renewal of its liquid contents, at the expense of the internal granular layer. Its external wall, surrounded by the aqueous humor, furnished it by endosmosis with the elements necessary for the maintenance of its vitality. Thus, its appearance is always the same, and the iris, being accustomed to its contact, is not irritated thereby. If it will always be so remains a question.

Such is the hypothesis we advance on the subject of this mobile cyst in the anterior chamber, a condition so interesting by reason of its extreme rarity. Once more we express our regret at not having been able to operate upon this case and our consequent inability to present a microscopical report upon the tumour.

REVIEW.

THE ANGLE NOTATION OF CYLINDRICAL LENSES.

BY

SYDNEY STEPHENSON,

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ATTENTIVE readers of the abstracts published in the last number of THE OPHTHALMOSCOPE[1] will observe that confusion threatens in the angular notation of astigmatism. Curious though it may seem, this unfortunate position has arisen from a recent attempt made by the XI International Congress of Ophthalmology to standardise notation.

It is, of course, a matter of common knowledge that for many years controversy has been rife in optical circles as to the best system of recording the axis of a cylindrical lens. In England, among ophthalmic surgeons at all events, the plan most favoured has perhaps been that which is represented in diagrams 1 and 2. It has been adopted by the majority of the ophthalmic

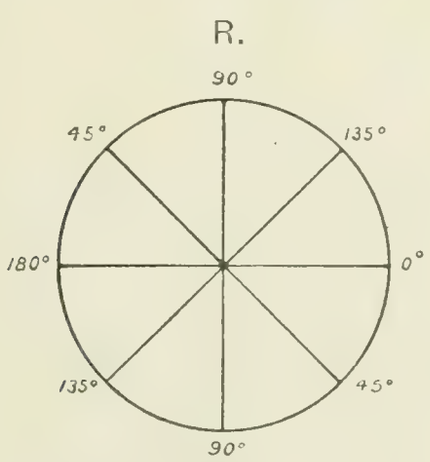

Fig. 1.

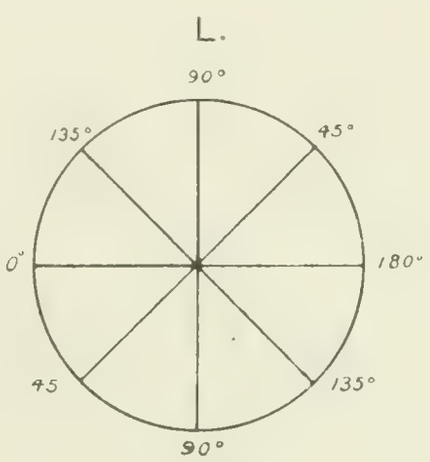

Fig. 2.

hospitals, and is the one most commonly given in the text-books which deal with refraction, when the matter is mentioned at all.

Another schema adopted at the Moorfields Hospital, as well as at Charing Cross Hospital, and the Hospital for Children, Ormond Street, London, is shown in diagrams 3 and 4. It is perhaps the most confusing of all, since the possibilities of error are duplicated in the case of each eye.

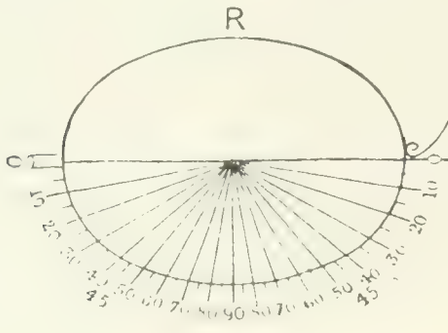

Fig. 3.

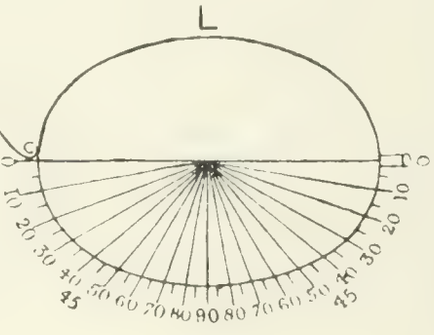

Fig. 4.

Some few years ago the Optical Society[2] appointed a Committee (the Chairman of which was the Astronomer Royal) to deal with the wider question of optical standards in general. The scientific character of the Committee will be apparent when it is stated that it included such well-known and representative names as those of Mr. W. H. M. Christie, F.R.S., Dr. R. Mullineux Walmsley, Sir William Abney, Mr. W. A. Dixey, Professor R. T. Glazebrook, F.R.S., Sir Howard Grubb, F.R.S., Dr. G. L. Johnson, and Professor Silvanus P. Thompson, F.R.S.

Among the recommendations made by the Committee, and approved by the Optical Society on May 16th, 1904, was one which dealt with the notation of cylindrical lenses[3]. It ran as follows:

Angle Notation for Cylindrical Lenses.—That the angle notation for cylindrical lenses be as follows: for the right eye the numeration to be from 0° at the nasal side, proceeding upwards to 90° and then downward to 180° on the temporal side, restarting from that point as from 0°, and proceeding downward for the second semi-circle. For the left eye the numeration to be from 0° at the temporal side proceeding similarly to 180° on the nasal side, restarting from that point as from 0° and proceeding downward for the second semi-circle. Each division of the circle should be 5°.

The standard, as fixed by the Optical Society, is shown in diagrams 5 and 6.

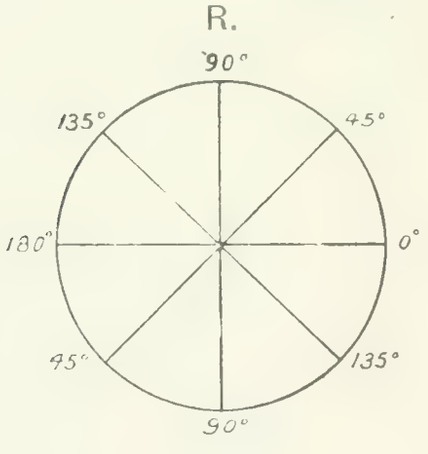

Fig. 5.

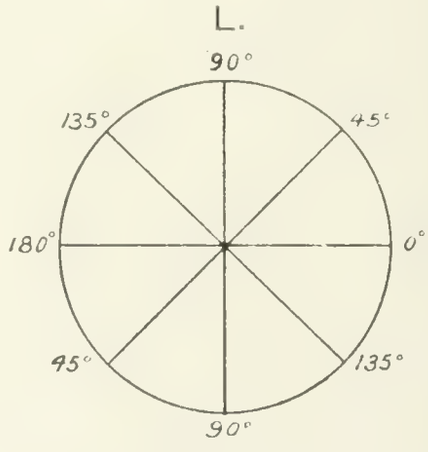

Fig. 6.

The decision of the Optical Standards Committee of the Optical Society was reached after careful and prolonged deliberation by scientists, opticians, ophthalmic surgeons, and others interested in the subject. It had several outstanding advantages. For example, it coincided with the recognized convention of angle measurement in mathematics. Again, there was the very important fact that it had already been adopted in the United States, almost without exception, both by opticians and ophthalmic surgeons.

At last, then—thanks to the public-spirited action of the Optical Society—

there seemed to be some likelihood that uniformity in the notation of cylindrical lenses would be secured, a hope strengthened by the fact that the majority of British opticians hastened to adopt the standard recommended by the Optical Society.

Unhappily for unification, however, the International Ophthalmological Congress[4] took a hand in the game. A Committee, consisting of Drs. Charpentier, Dimmer, Eperon, Hess, Jessop, Nuël, and Reymond, decided to recommend for adoption a plan which differed from that accepted by the Optical Society.

There have been some differences of opinion as to the precise nature of the standard then recommended. The official report[5], *which was printed before the actual meeting of the Congress,* runs as follows :

> The Committee . . . . having carefully considered the various methods at present in use, have unanimously come to the following conclusion :
>
> 1. That the meridians of astigmatism should be measured and represented as the observer looks at the patient.
>
> 2. That the best and most practical method to measure and represent the axes is in the lower semi-circle, as in a trial frame.
>
> The numbering of the axes should start from the middle line of the face in each eye, and proceed downwards and temporalwards. The zero would, therefore, lie at the nasal end of the semi-circle and 180° at the temporal end ; 90° would be below and midway between these points.

The foregoing was the version attributed to Mr. W. H. H. Jessop[6], one of the corresponding members for Great Britain, in explaining to the Ophthalmological Society on a recent occasion the action taken by the International Ophthalmological Congress. Dr. K. Grossmann[7], however, has traversed Jessop's statement. According to Grossmann, the Congress ordained that the axis of a cylinder should be measured and recorded in the upper semi-circle of the trial frame. It is obvious that Jessop's and Grossmann's reading of the decision of the Congress is wholly at variance, as will be apparent from a glance at the diagrams below (7, 8, 9, and 10).

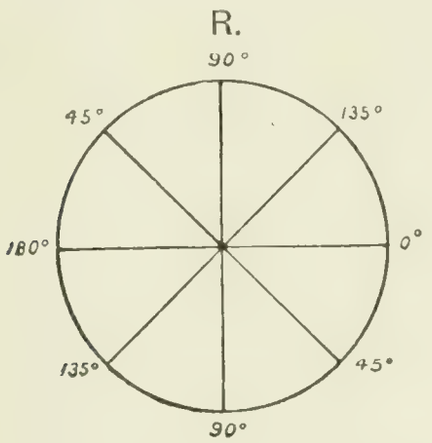

Fig. 7.

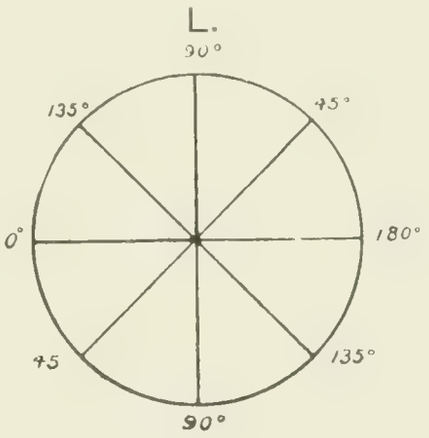

Fig. 8.

What is the explanation of this curious discrepancy? Dr. Grossmann[7] states that after the report was drafted by the Committee, and before it was discussed by the Congress, the Committee had ample opportunity for convincing themselves that their proposal (see above) of selecting the lower semi-circle of the trial frame "would be rejected by almost every one." The Committee, therefore, changed the recommendation from the lower to the upper semi-circle, and the amended version was adopted by an overwhelming majority of those present at the Congress. Truly, a very pretty piece of scientific work!

From the present point of view, however, it matters little which is correct. The important point is that the notation proposed by the Congress differs from that of the Optical Society.

In view of the fact that the standard recommended by the International Ophthalmological Congress is intended to replace another modern standard, already widely adopted both in Britain and America, it is but natural to enquire whether the grounds for the proposed change are adequate or the reverse. Nothing but the soundest reasons could justify the alteration, opposed, as it is, to the decision of a responsible and representative body, such as the Optical Society. Here are the Committee's words in presenting

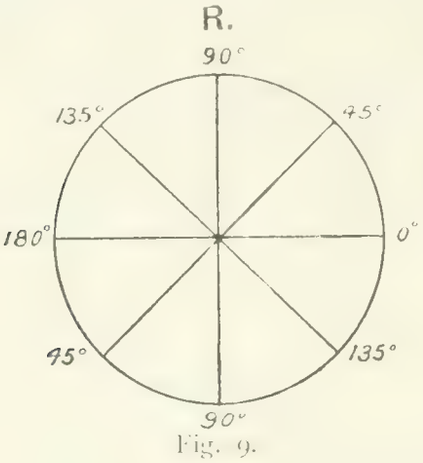

Fig. 9.

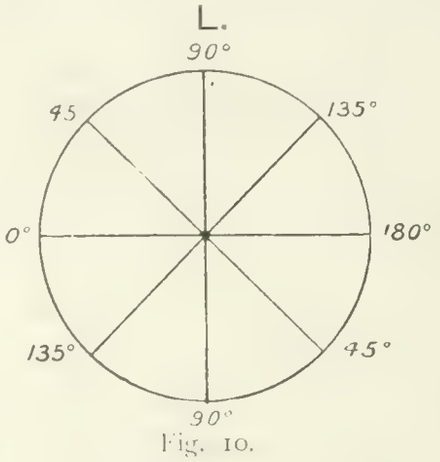

Fig. 10.

the Report to the Congress for adoption :—' This method has the merit of simplicity, as in noting an axis only the number of degrees found need be stated (*sic*). It also fulfils the important point that the usually symmetrical meridians of intra-ocular astigmatism are represented by the same number." And that is all! Can anybody seriously contend that on such feeble grounds as those the Congress was justified in the action it took?

Indeed, one is almost tempted to surmise that the English-speaking members of the Congress had failed to make themselves acquainted with the pioneer work of the Optical Society, for it can scarcely be supposed that the burning question of opticians *versus* ophthalmic surgeons has been allowed to intrude upon what is essentially a scientific matter.

Be the explanation what it may, the recent decision of the International Ophthalmological Congress has been such as to render confusion worse confounded. Their standard is opposed to the standard endorsed by the Optical Society, and now adopted by almost every optician in Great Britain and the United States. To speak quite plainly, the ill-advised action of the Congress has set back the hands of the clock, and so far from simplifying matters, has rendered the adoption of a standard increasingly difficult.

The writer holds no brief for this or that method of notation. He is well acquainted with the arguments that may be urged for and against any particular method. At the same time he cannot but deplore the absence of a standard common to ophthalmic surgeons and opticians throughout all civilised countries. It is, however, clear that in the present state of chaos every ophthalmic surgeon will be wise to indicate the precise axis of any cylindrical lens he may prescribe, not only by a figure, but also by a simple stroke diagram. It is only by some such means that disappointment and annoyance can be avoided.

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1. The Ophthalmoscope, September, 1909, p. 628.
2. **Dixey, W. A.**—The Ophthalmoscope, 1908, p. 686.
3. *The Optical Society's Standards* (Spectacles and Eye Glasses.) Published by the Optical Society, 20, Hanover Square, London, W.
4. The Ophthalmoscope, 1909, p. 379.
5. *XI Congresso Internazionale di Oftalmologia*, Fascicolo secondo, p. 311. Naples, April 2-7, 1909.
6. **Jessop.**—*British Medical Journal*, June 19th, 1909, p. 1482.
7. **Grossmann, K.** - *Ibidem*, June 26th, 1909, p. 1573.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—THE ACCESSORY SINUSES.

(1) Chance, Burton.—A case of accessory sinus disease with the symptoms of an osseous tumor of the orbit. *New York Medical Journal*, March 14th, 1908.

(2) Fromaget.—On the treatment of orbital cellulitis caused by fronto-ethmoidal sinusitis. (Traitement des phlegmons orbitaires dus aux sinusites fronto-ethmoidales.) *Ann. d'Oculistique*, T. CXXXIX, p. 439, juin, 1908.

(3) Hanna, Henry.—A fatal case of cavernous sinus thrombosis following chronic purulent otitis. *Journal of Laryngology, Rhinology, and Otology*, July, 1908.

(4) Johnston, Richard H.—Exophthalmos as a complication of accessory cavity disease. *American Medicine*, August, 1908.

(5) Reber, Wendel.—Orbital abscess secondary to nasal disease. *Pennsylvania Medical Journal*, August, 1908.

(6) Johnston, R. H.—Exophthalmos as a complication of accessory cavity disease. *American Medicine*, August, 1908.

(7) Thomson, St. Clair.—The causes and symptoms of thrombosis of the cavernous sinus. *Ophthalmic Review*, October, 1908.

(8) Welty, Cullen F.—Ethmoidal perforation of the inner corner of the eye and involvement of the antrum of Highmore. *Journal of the American Medical Association*, October 17th, 1908.

(9) Knapp, Arnold.—Bilateral optic neuritis after ethmoiditis. *Trans. American Ophthalmological Society*, Vol. XI, Part III, 1908.

(10) Gutmann, A.—Bilateral orbitalphlegmon, bilateral thrombosis of the ophthalmic veins, and of the cavernus sinus after empyema of the ethmoidal sinuses. (Doppelseitige Orbitalphlegmone, doppelseitige Thrombose der Vena ophthalmica und des Sinus cavernosus nach Siebbeinempyem.) *Zeitschrift f. Augenheilkunde*, Januar, 1909.

(11) Jackson, Edward.—Ocular and orbital symptoms of thrombosis of the cavernous sinus. *Ophthalmology*, January, 1909.

(12) Bartels, M.—The ophthalmoscopic appearances in thrombosis of the cerebral sinuses. (Augenhintergrundsbefunde bei Hirnsinusthrombose.) *Zeitschrift für Augenheilkunde*, Januar, 1909.

(13) Paunz, Marc.—On rhinogenous optic neuritis. *Archives of Ophthalmology*, January, 1909.

(14) Eales, Henry. Ocular affections due to nasal disease. *Birmingham Medical Review*, January, 1909.

(15) Stephenson, Sydney.—A case of thrombosis of the cavernous sinus, together with brief pathological and bacteriological notes. *Lancet*, February 20th, 1909.

(16) Grant, J. Dundas.—Two cases of retrobulbar neuritis probably attributable to sphenoidal disease. *Proceedings of the Royal Society of Medicine*, May, 1909.

(17) Risley, S. D.—Optic neuritis associated with disease of the sinuses accessory to the nose. *Journ. Nervous and Mental Disease*, May, 1909.

(18) Ginzburg, J. — Cases of cavernous sinus thrombosis. (Zur Kasuistik der Sinus cavernosus-Thrombose.) *Centralbl. f. prak. Augenheilk.*, Juni, 1909.

(19) Pierce, Norval H. — The anatomical relationship between the accessory nasal sinuses and the orbit. *Journal of Ophthalmology and Oto-Laryngology*, 1909, Vol. III, p. 53.

(1) **Chance's** (Philadelphia) case is interesting on account of the question of diagnosis. Had the tumor been soft and painful, or had there been discharge from the nose, the ethmoidal origin of the trouble would have been suspected. The extreme hardness of the mass, with lack of tenderness, pain, and nasal trouble, caused the writer to regard it as one of possible osseous growth. The characteristics were explained by the fact that the bone was bulged forward, and the enlargement was really situated beneath it. C. A. OLIVER.

(2) **Fromaget** considers that in cases of orbital cellulitis secondary to sinusitis, it is necessary freely to open and to drain the frontal, ethmoid, and maxillary sinuses, since all these cavities will, as a rule, be found diseased. For dealing with the frontal and ethmoid cells, he recommends the method of Killian, and he records four cases under his care in which this operation, combined with drainage of the maxillary sinus through the canine fossa, was performed by Claoué with good results. R. J. COULTER.

(3) The principal point of interest in **Hanna's** case is that up till about twenty days after a radical mastoid operation, during which internal symptoms had pointed only to meningeal irritation and septic absorption, no eye symptoms appeared. On the twenty-third day there were œdema of lids and conjunctiva, with proptosis of the left eye. Some hours later the right eye showed a similar condition, and the patient became comatose and died. At the autopsy, in addition to other findings, there was well-marked purulent cavernous sinus thrombosis. ERNEST THOMSON.

(4) Based upon a study of several personal cases and a review of the subject, **Johnston** (Baltimore), is of the opinion that a careful nasal examination will often point the way to successful treatment. C. A. OLIVER.

(5) The first of **Reber's** (Philadelphia) two interesting cases was seen in a five years' old child. The condition was caused by the impaction of a bean in the corresponding nasal fossa. Under appropriate treatment, the abscess subsided without any intraocular extension. The second, which exhibited bulbar changes, and which was seen in an adult female, was the result of an acute purulent inflammation in the frontal sinus. Cure in this case was effected by free evacuation of pus from the orbital cavity. C. A. OLIVER.

(7) **Thomson** (London). — This is a paper which was read during the discussion of the relation of the accessory sinuses of the skull to diseases of the eye at the annual meeting of the British Medical Association, held at Sheffield in 1908. The causes of thrombosis of the cavernous sinus are chiefly found in the nose and ear, but the symptoms are most

marked in and about the eye. The most frequent origin of the infection leading to this disease is to be found in the accessory cavities of the nose and sometimes in the ear. Diagrams are given showing the close relation of these parts. The most common of all the sinuses to cause the disease is the sphenoidal sinus, next comes the ear, third the ophthalmic vein and its anastomoses, and, lastly, the pterygoid plexus. The three chief eye symptoms are: (*a*) papillary œdema, (*b*) chemosis, and (*c*) exophthalmos. There may be anæsthesia and ulceration of the cornea, and paralysis of the ocular muscles. The condition of the pupil varies. There is in most cases papillitis followed by atrophy, and the vision may be unaffected or the eye may be blind. Several photographs are given of patients suffering from this disease. C. DEVEREUX MARSHALL.

(9) **A. Knapp**, of New York, reports a very conclusive example of optic neuritis due to ethmoiditis in a female of thirty years. When first seen, the left eye was completely blind, and had been so for a fortnight. Optic disc of that side swollen (2.5 D.). Both middle turbinates were swollen and "soggy," and there was muco-pus in the left upper meatus. Removal of the anterior half of the left middle turbinate was speedily followed by an improvement in the sight of the left eye, and four days after operation, the left visual field showed a large central scotoma which grew smaller almost literally day by day. About a month after operation, L.V. = 20/40. On that date the patient complained of her right eye, the optic disc of which was hazy and congested. V. = 20/50. A paracentral scotoma was present in the field. Three days latter, the right middle turbinate was partly removed. To shorten the story, which is told chronologically by the author, the patient eventually recovered full vision. The left disc, however, remained pale. SYDNEY STEPHENSON.

(10) **Gutmann** (Berlin).—The patient, aged 29, developed an acute rhinitis followed on the second day by swelling of the eyelids on both sides with conjunctional ecchymoses. The eyeballs were both markedly proptosed, the temperature was raised, and the pulse was 100. The retinal veins were congested, but there were no other ophthalmoscopic changes. The ears were normal, the nose, as already stated, was in a state of acute rhinitis. Thrombosis of the cavernous sinus and ophthalmic veins was diagnosed, and the patient was admitted into the surgical *clinic*. During the day the exophthalmos became very marked, the patient became comatose and died the same evening. At the autopsy, basal cerebrospinal meningitis was present. there was ethmoidal empyema on both sides, and both cavernous sinuses were full of disintegrating thrombi. The orbital contents were removed *en masse* and examined histologically. A full account of the pathology is given in the paper. The tissues were crammed with *streptococci* and *staphylococci*.

T. HARRISON BUTLER.

(11) **Jackson** (Denver, U.S.A.) gives a lucid account of the important symptoms of cavernous sinus thrombosis, based on a study of 2 personal and 207 published cases. Although the condition is not often caused by ocular disease, its diagnosis rests on the ocular and orbital symptoms. First in importance is exophthalmos, due to venous stasis and swelling of the orbital tissues. It is accompanied by swelling of the eyelids and face and chemosis. Exophthalmos increases progressively for some days, and, it is important to note, may then subside from the development of collateral circulation, even in cases which ultimately prove fatal. The ophthalmoscopic evidences of venous obstruction are also usually present. These are congestion and œdema, or actual "choking" of the disc, with enlargement and tortuosity of the retinal veins. Paralysis of the levator palpebræ superioris and of the ocular muscles, intrinsic and extrinsic, may occur, but diplopia, if present, may also be due to mechanical

displacement of the eyeball. Other ocular symptoms are pain, visual disturbance, and injury to the conjunctiva and cornea from exposure. In the great majority of cases the other eye becomes involved by extension through the circular sinus. A. J. BALLANTYNE.

(12) **Bartels** (Strasburg) after discussing the whole question and citing several interesting cases, comes to the following conclusions: complete obstruction of the blood flow in both cavernous sinuses need not give rise to a choked disc, not even when most of the orbital veins participate in the thrombosis. The septic nature of the thrombus has, at any rate during the first week, no influence upon the result. If a choked disc appears in the course of cavernous sinus thrombosis it indicates an intracranial complication which limits the cranial capacity (*eine raumbeengende intrakranielle Komplication*).

Well-marked post-operative choked disc in otitic sinus thrombosis must not be regarded as an indication for a bad prognosis, since its cause is not well understood, and it disappears spontaneously without deterioration of the visual acuity. This post-operative choked disc may appear without any other objective or subjective signs.

An apparent or pseudo-neuritis can frequently be diagnosed as such by examining near relations who often have the same disc condition.

The paper is a valuable one, for it is often stated that optic neuritis with congested veins and hæmorrhages is a constant sequel to sinus thrombosis.

T. HARRISON BUTLER.

(13) **Paunz** gives notes of six cases occurring in the Budapest University eye clinic, in which retrobulbar neuritis was evidently caused by disease in the nasal passages. In all but one case, in which a polypus was present, suppuration existed. Operative measures, *e.g.*, clearing out the ethmoid cells, removal of polypus, were followed in all cases but one (in which, as a consequence of chronic ethmoidal and sphenoidal suppuration, atrophy was already present) by marked improvement or complete recovery. In two cases, both unilateral, papillitis was present. In one case there were no fundus changes. Colour scotomata were demonstrated in every case but one, in which a functional examination was impossible. There was no orbital cellulitis in any case. In one case only could the eye affection be attributed to a recent coryza. In two cases, although pus was present in large amount in the nasal passages, there was no complaint of nasal discharge. There is an intimate anatomical relation between the optic canal and the posterior accessory sinuses. In the optic canal the periosteum is replaced by an extension of the dura mater, and quite a small amount of pus collecting between this sheath and the bony wall would cause compression or inflammation of the nerve. This fact may account for the rapid and marked loss of vision. In those cases which recover rapidly and almost completely, probably an œdema or peri-neuritis occurred, whilst true optic neuritis has been present where atrophy follows. The spread of inflammation probably takes place by means of blood-vessels and lymph channels with osteo-phlebitis, periostitis, and perhaps necrosis, as important contributory factors. Disease of the posterior ethmoidal cells is more often the cause of optic neuritis than disease of the sphenoidal cells. ROSA FORD.

(14) **Eales** (Birmingham) reports a number of cases in which disease of the accessory sinuses led either to invasion of the orbit or to retrobulbar neuritis. The paper does not lend itself to abstract, being mainly composed of case-histories. The subject is one the importance of which is quite recognised by ophthalmic surgeons, and this paper, apparently addressed to a general medical audience, will bring that importance home to those who are not rhinologists or ophthalmologists. ERNEST THOMSON.

(15) **Stephenson**, of London, reports a fatal case of thrombosis of the cavernous sinuses in a man of 27 years, from whom about a fortnight prior to the advent of the cerebral symptoms, a nasal polypus had been removed. The symptoms were typical—restricted movements of the eyeballs, bilateral proptosis and chemosis, marked distension of the retinal veins, haziness of the optic discs, high temperature, and a tendency to drowsiness and somnolence. Towards the close, pyæmic abscesses developed in the orbits and at the root of one index finger. The patient died after an acute illness that had lasted for twenty-three days. At the *post-mortem* examination, pus (containing pneumococci) was found in the cavernous and circular sinus, sphenoidal sinus, and ethmoidal cells. An organized thrombus ran from one cavernous sinus to the other through the circular sinus. The conclusion reached by Stephenson was that infection had spread from the ethmoidal and sphenoidal to the circular and cavernous sinus, and had set up a septic meningitis associated with pyæmia, to which the patient ultimately succumbed.

(16) **Grant** (London) reports a couple of cases of retrobulbar neuritis where removal of portions of the middle turbinated body was followed by recovery of sight. But as the author himself remarks, "the actual complicity of the posterior cells is doubtful." SYDNEY STEPHENSON.

(17) **Risley**, of Philadelphia, is convinced that we have not yet appraised at its full value the responsible part played by affections of the orbital sinuses in the production of ocular discomfort and ocular disease. To illustrate this contention, he reports three cases, of which brief details follow :—

1.—A man of 47 years came with proptosis of the right eye, unilateral optic neuritis, and V. 1/5. The right nostril was stuffed with polypi. Transillumination showed that the right frontal sinus and maxillary antrum were impervious to the light-rays. Evacuation of the purulent contents of the affected sinuses was followed by subsidence of the neuritis, and disappearance of the proptosis, with restoration of V. to something more than normal (6/5).

2.—A man, aged 40 years, suffered from bilateral optic neuritis, with R.V. 6/10 and L.V. 6/6. The visual fields were contracted to 40° (approximately). Under the impression that the symptoms might be caused by an intra-cranial tumour, trephining was recommended, but declined by the patient. Two years later, during which interval the symptoms, both objective and subjective, varied much, both middle turbinals were removed, an operation followed by phenomenal relief. Vision rose to 6/6 in each eye, and one month after the operation, the visual fields were normal. The optic neuritis slowly subsided.

3.—A male patient, aged 58 years, sought relief for failing sight in the left eye. The right eye had been useless from childhood (amblyopia, convergent strabismus, and high hypermetropic astigmatism). The sight of the left eye was reduced to 6/60, and the field of vision was concentrically contracted to 30°. Right eye—optic atrophy; left eye—papillitis. Transillumination showed both frontal sinuses opaque. The upper nasal fossæ were stuffed with huge polypoid masses on both sides, but the right nostril was completely blocked. Removal of the polypi with the snare was followed by the escape of large quantities of pus. Amputation of the middle turbinate was advised but declined by the patient. After a few weeks' treatment directed to the nasal fossæ, the sight of the left eye had risen to 6/15. Some sixteen months later, however, it had sunk to 1/10, and the nostrils were again stuffed with polypi. The polypi were removed. When seen some five months after the second operation, there was an absolute central scotoma and fixation was eccentric. Eventually, the patient became entirely blind in both eyes from optic atrophy. No positive evidence of intracranial or central nerve disease was discovered. SYDNEY STEPHENSON.

(18) **Ginzburg** recounts three cases of thrombosis of the cavernous sinus. The first was that of a girl aged 19, who in the course of six months developed marked exophthalmos, with immobile pupils and double optic neuritis, chemosis of the lids and œdema of the tissues about the root of the nose. *Post-mortem*, an osteo-sarcoma of the sphenoid, involving the sinuses was found. The second case was a child of $9\frac{1}{2}$ years, in whom, three days after the squeezing-out of a hordeolum by her parents, the upper lid of the right eye began to swell. This increased and an abscess formed, and so an incision was made into the lid along its whole length down to the tarsus. The swelling went down, but four days later there was marked exophthalmos of the right eye, and next day a similar condition of the left. Ophthalmoscopically, the eyes were normal. The child gradually sank and died on the 46th day.

In the third case, that of a woman aged 34, the source of infection could not be determined. The disease started as an orbital phlegmon and extended along the veins to the sinuses. The patient died within the week.

A. Levy.

(19) **Pierce** (Chicago) gives a *resumé* of all the important practical points relative to this subject. Henry L. G. Leask.

II.—UNIFORM NOTATION OF THE VISUAL ACUITY.

Hess, C.—On uniform estimation and notation of the visual acuity. *XI Congresso Internationale di Oftalmologia*, Fascicolo primo, p. 5-24, Aprile, 2-7, 1909.

Hess (Würzburg) reports the conclusions arrived at by the Committee appointed at the IX International Congress to consider the question of international test types. The Committee is of opinion, that test types to be international, must be of the nature of those of Snellen's hooks or Landolt's rings, or must be so constructed that the results are comparable with those arrived at with the above. A great deal of confusion has been caused by the circumstance that the visual acuity has been determined by methods which, to some extent at least, test something else in addition to what is generally meant by the term. Visual acuity is, as a rule, defined as the acuity necessary to distinguish between two very fine dots. According to this definition, the test-types should consist of pairs of dots. Experience teaches that two such dots can be distinguished as separate dots if the distance between them subtends an angle of one minute, and from this the inference has been drawn that the details of letters, figures, etc., should also be visible, if they subtend the same angle. But this is not so. There are other factors which play a part in such tests, and are more delicate than the optical powers of the eye represented in the act of resolving two dots. The letters of any row of Snellen's test-types are not all equally well seen. Some of those of D.=6m may be read at 7m, while others can only be distinguished at 5m. If measured by the former letters, the visual acuity would therefore be 40 per cent. greater than if measured with the latter. Thus, the principle of these test-types is wrong, but it does not follow that letters should not be used at all. The mistake which Snellen made was to force letters with simple and complicated outlines into squares of the same size. Letters are practical, and perfectly suitable, provided that proper ones are chosen, and it is remembered that they are not intended for determining the "*minimum separable*" or the "*minimum visible*", but the "*minimum legibile*". If letters are chosen which can just be distinguished at the same distance as the corresponding Landolt rings, then they are theoretically quite as good. The rings, however, have some advantages; they cannot be learnt by heart, they can be varied very easily by changing the position of the break, and, finally, they can be used for illiterates. Nevertheless, ophthalmic surgeons generally do not wish to discard the letters. The Committee therefore propose test-types, in which the Landolt rings are combined with figures —the latter in preference to letters because they are often read by illiterates, and recommend the test types designed by Hess (published by Bergmann, Wiesbaden). The proper size of the figures in these test-types was determined by experiment. Those corresponding to Landolt D.=5m. it was found, require to be 6mm. high and 1.2mm. thick. The figures are arranged in arithmetical progression, so that the step from the smallest type to the next size is smaller than that between the largest size and the next one. Percival J. Hay.

III.—PARALYSIS OF ACCOMMODATION.

(1) **Fromaget.—Recurrent paralysis of accommodation following diphtheria in a hypermetrope.** (Paralysie récidivante de l'accommodation chez une hypermétrope à la suite de la diphtérie.) *L'Ophtalmologie Provinciale*, T. V, p. 35, mars, 1908.

(2) **Henderson, F. L.—Post-diphtheritic paralysis of accommodation.** *American Journal of Ophthalmology*, April, 1909.

(1) **Fromaget** records the case of a girl who developed complete paralysis of accommodation three weeks after an attack of diphtheria. This disappeared under treatment in three weeks, but began to return after an interval of eight months, and was again complete two months later, when it was cured in a week by wearing glasses constantly to correct a hypermetropia of 1.25 D. The author considers that the second attack was due to asthenopia, aggravated by the hypermetropia. R. J. COULTER.

(2) **Henderson** (St. Louis) endeavours to find answers to the questions: (1) Where is the lesion causing this isolated paralysis? (2) How does the toxin of the Klebs-Loeffler bacillus cause this paralysis? (3) Why does this toxin paralyse the ciliary muscle more frequently than any other muscle in the body except the velum palati? From a study of the literature he concludes that the lesion is in the nerve-endings in the affected muscle, and that it is of the nature of an inflammatory neuritis. It is difficult to explain why this particular muscle should be affected, just as it is difficult to explain saturnine wrist-drop, alcoholic foot-drop, or syphilitic affections of the posterior spinal roots. The predisposing cause seems to be excessive saturation of non-insulated terminal filaments with morbid blood due to their arrangement in the vascular ciliary body. The exciting cause lies in the difficulty of resting this involuntary muscle and the fact that, instead of attempting to rest it, it is subjected to unusual exercise in so far as the child is provided with paper dolls to cut out, picture books to look at, or is given school books in order to make up in a few days the weeks which have been lost. Rest is secondary to anti-toxin as a prophylactic against all forms of post-diphtheritic paralysis. It seems wise, when enforcing rest of all the other muscles of the body which can be rested—the heart and diaphragm cannot be rested and their paralysis is the most dreaded sequela—to insure rest of the ciliary muscle by prohibiting all use of the eyes, and keeping the child from school, for at least six weeks after the beginning of convalescence.

ERNEST THOMSON.

IV.—THE OCULAR MANIFESTATIONS OF LEPROSY.*

(1) **Hollmann, H. T.—Diseases of the eye, ear, nose, and throat among persons affected with leprosy.** *New York Medical Journal*, October 26, 1907.

(2) **Sauvineau and Morax.—A new case of leprous keratitis hyperplastic type), with anatomical examination.** (Un nouveau cas de kératite lépreuse (type hyperplastique), avec examen anatomique.) *Annales d'Oculistique*, août, 1908.

*For abstract by Mr. Harold Grimsdale of a recent important communication by Calderaro on Lepra Nodosa of the Eye, see THE OPHTHALMOSCOPE, June, 1909, p. 423.

(3) Karnitzky, K. and Weinstein, A.—A case of leproma corneæ. (Ein Fall von Leprom der Hornhaut.) *Klin. Monatsbl. f. Augenheilkunde*, März, 1909.

(4) Roche, Charles.—A case of leprous keratitis. (Un cas de kératite lépreuse.) *Recueil d'Ophtalmologie*, avril, 1909.

(1) In a year's study of the patients in the Leper Settlement in Hawaii, **Hollmann** has made some very interesting studies of the eye conditions. The carefulness of the observations, and the number of the cases seen, make the report an extremely valuable one. In addition to the ordinarily recognised ocular signs of the disease, he mentions some new ones. Among these he speaks of a condition which he designated as "Leprous Ophthalmia" which is "due to true leprous involvement of the conjunctiva." As one of the principal causative factors in the formation of this variety of inflammation, he names "the formation of leprous tubercles in the choroid coat of the eye," which "when of a large size often disintegrate and ulcerate externally." Among a few of his patients he has found a peculiar condition which he says "I can only describe and not name, as I can find nothing analagous in any textbook on diseases of the eye." For convenience sake he has called it "a leprous pterygium associated with pannus." He says "it starts undoubtedly in a leprous tubercle of the choroid coat which finally disintegrates and ulcerates externally; subsequently from this point a hypertrophic overgrowth extends to and gradually involves the cornea. It is plentifully supplied with blood-vessels—hence a condition of pannus. When once it has completely involved the cornea, there is no hope for vision, except possibly through an iridectomy. If the condition is seen in time we can arrest its progress, but for how long we do not know, as it has been only for the last year that we have attemped to arrest it." CHARLES A. OLIVER.

(2) **Sauvineau** and **Morax**, of Paris, record the case of a mulatto, aged 43, who was first treated in November, 1906, for "a sort of small corneal abscess," situated at the periphery of the right cornea, near the limbus in the lower-outer quadrant. At this time he presented, in addition to the condition for which he sought treatment: 1. old kerato-iritis, with annular posterior synechia in the right eye; 2. a commencing pterygium in the left eye; 3. conjunctivitis of lacrymal origin in both eyes, with a lacrymal fistula in the right; 4. marked leprosy of the hands. In spite of treatment, fresh iritis developed, the cornea became perforated, allowing the iris to prolapse, and the eye, having become totally blind, was enucleated in April, 1907, when it presented the following appearance: the lower and outer part of the cornea was occupied by an oval, fungating tumour, projecting 4 mm., with an umbilication in its centre, due to exfoliation. The remainder of the cornea was hazy, but a shallow anterior chamber could be seen through it, with a pupil, 2½ mm. in diameter, running into the neoplasm. The tension was very high. Downwards and outwards, around the tumour, there was intense vascularisation, and there were distended vessels running from the upper-outer part of the conjunctiva across the cornea to the tumour. There was a ciliary staphyloma upwards and outwards. In spite of unusual swelling of the tissues, a good socket was obtained after the enucleation. Later, iritis developed in the left eye. On pathological examination, the lower and outer part of the cornea was found to be thickened to 20 times its normal size by a richly vascularised cellular infiltration presenting a fasciculated disposition, so as to resemble a fasciculated sarcoma. Scattered corneal lamellæ were present even in the deepest parts of the tumour which were not so vascular as the more superficial layers. Bowman's and Descemet's membranes were

absent. The iris was fixed to the back of the tumour, leaving only traces of the anterior chamber which was usually filled with cellular exudation. In the neighbourhood of the angle of the anterior chamber the iridic tissue was continuous with the leprous infiltration of the cornea which shewed marked pigmentation. Under a high power, the tumour was seen to consist of large mononuclear cells stuffed with acid-resisting bacilli. The infiltration could be traced for some distance past the limbus into the sclerotic and there was also scattered infiltration, rich in bacilli, in the ciliary region. At one or two points in the choroid in contact with the sclerotic, some cells containing lepra bacilli were found. R. J. COULTER.

(3) Eye affections in leprosy are extremely common, but a tuberous outgrowth of the cornea, as described by **Karnitzky** and **Weinstein**, belongs to the rarer manifestations of the disease. The cornea is never the primary seat of a leprosy-granuloma, but becomes invaded from the limbus. The case was that of a woman who was suffering from tubercular leprosy two years. The right eye was normal, but the left showed absence of the eyebrows and eyelashes and complete lagophthalmos, the result of cicatricial shortening and ectropion of both lids. The lower two-thirds of the cornea and the adjoining sclerotic to the extent of 3 to 4 mm. were occupied by a tumor which was apt to bleed, of a yellowish-pink colour, more than the size of a filbert, and was of soft consistence. The upper third of the cornea was normal; vision, fingers at one metre. The tumor was removed at its base and examined under the microscope. The covering epithelium consisted of several layers and sent out numerous projections into the underlying granulomatous tissue. The latter was made up of cells of various shapes and sizes and of a poorly-developed matrix of connective tissue. Leprosy bacilli were present in great numbers. The epithelium in this and similar cases had so much the appearance of conjunctival epithelium that some authors considered it to be derived from the conjunctiva. But Karnitzsky and Weinstein insist upon its being corneal epithelium, which has undergone transformation. C. MARKUS.

(4) Some ten years ago Perrin (*Thèse*, 1899) published the details of eleven cases of leprosy observed by him in Marseilles. In France, nowadays, the disease is known to linger in Brittany, as well as in certain villages of the Alpes-Maritimes and the Bouches-du-Rhône.

Roche, of Marseilles, gives details of a case in a female, 30 years of age, both of whose corneæ were affected by a thickened, yellowish growth, which passed, without clear line of demarcation, into the neighbouring ocular conjunctiva. The growth involved the outer half of one and the outer two-fifths of the other cornea. There was no inflammatory reaction, and the corneal sensibility was intact. The condition had been present for four years. Apart from the changes described, the eyes were normal. Other evidences of tubercular leprosy included bosselated growths (some of which were ulcerated) on various parts of the face and limbs. Ulcerative lesions were also present on the mucous membrane of the upper lip and palate. These more or less general symptoms dated from eight years. Numerous lepra bacilli were found in the saliva, as well as in secretion from the ulcerated growths. The author concludes that the patient had probably contracted the disorder at Pompiane, near San Remo, where she had spent the first ten years of her life. The incubation period, on this view, had amounted to thirteen years. At the same time it was impossible to deny that infection might have taken place at Marseilles, where the woman had resided for twenty years uninterruptedly. SYDNEY STEPHENSON.

V.—PERSISTENT HYALOID TISSUES.

(1) **Calderaro.—A note on the persistent remains of the hyaloid vessels. The classification of the cases and their origin. (Contributo allo studio dei tessuti jaloidei persistenti. Loro classificazione e genesi.)** *La Clin. Oculist.*, May, 1909.

(2) **Calderaro.—Investigation of the persistent hyaloid tissues in the adult human eye. (Ricerche embriologiche, anatomiche e cliniche sulla persistenza dei tessuti jaloidei nelli occhio umano adulto.)** *Report XI International Congress of Ophthalmology*, Fascicolo Secondo, April, 1909.

(1) and (2) In these two papers, which are founded on the same observations, **Calderaro** deals fully with the subject of persistent hyaloid remains. He points out that the vessels are rarely found, and that the tissues visible in the adult eye are not the fœtal membranes, but tissues which have taken the place of them ; it is one of the rare forms to find the vessels pervious, although the common name for all these abnormalties is "persistent hyaloid artery." In the embryo the artery, entering the eye at the papilla, is primarily an artery for the vitreous and lens-capsule, and only secondarily, at a later stage, does it give off the branches which become the retinal arteries. At the fifth month of fœtal life the hyaloid artery proper begins to undergo regressive changes. The prepapillary mass appears, when the embryo is 63 mm. long, as a cellular sheath which surrounds the artery from the point of exit at the disc, without coming into actual contact with the vessel-walls. It increases until the sixth month, and then gradually shrinks. The hyaloid canal of Cloquet) appears after the disappearance of the peripheral branches of the artery. It begins a little anterior to the extremity of the prepapillary mass and finishes behind the posterior surface of the lens by an enlarged funnel-shaped end. All clinical varieties result from imperfect absorption of one or other of these several factors.

The paper in *La Clinica Oculistica*, which is copiously illustrated, contains a detailed account of the histology of the residual filaments in two adult eyes, and also of the eye of a seventh month syphilitic fœtus, in which there was found considerable change of the vitreous and optic disc. The papilla showed a small funnel-shaped excavation, the surrounding nerve-fibres being somewhat raised. The surface of the cup was covered by irregular masses of small cells, which sent thin bands between the optic fibres and over the surface of the retina for at least the distance of the disc diameter. From the cup and lateral part of the papilla the small-celled infiltration projects forward into the vitreous, and following the direction of the canal of Cloquet, reaches almost the lower margin of the lens ; here the small-celled masses become larger and send prolongations towards the ciliary body and along the posterior surface of the lens. In this way the inflammatory mass forms a band between the papilla and the lens. In the central part the fibres are thin and almost parallel ; towards the disc they are irregular, and extend into the neighbouring vitreous. It is clear that in this case an inflammation caused the appearance of the mass in the position of the preceding canal of Cloquet, and that if the embryo had become adult, there would have been a permanent record of this inflammation following closely in shape and position the canal. H. GRIMSDALE.

VI.—ERYTHROPSIA.

Vogt, A.—The cause and nature of erythropsia. (**Ursache und Wesen der Erythropsie.**) *Bericht der Ophthalmologischen Gesellschaft zu Heidelberg*, 1908, p. 185 (Volume published in 1909).

Vogt, of Aarau, discusses the erythropsia caused by dazzling light which appears after iridectomy and extraction of cataract, and in normal eyes after the use of mydriatics and exposure to the bright reflection from masses of snow. Fuchs and others have regarded the phenomenon as due to the influence of ultra-violet rays upon the visual purple. Vogt thinks that the fact that erythropsia can be produced by light which has passed through heavy flint or yellow glasses renders this explanation untenable. He regards erythropsia as a very frequent physiological condition, and suggests the following experiment to prove his views.—Go into a well-lighted street and close one eye with the hand. After looking at a brightly illuminated surface for five or more minutes, go into the shade and open both eyes. It will now be noticed that the two eyes see objects differently coloured. When the eye which remained open is used everything has a red tinge, and the intensity of this physiological erythropsia depends upon the different intensity of the two illuminations. The more powerful the light which has previously acted upon the eye, and the duller the succeeding, the more pronounced the erythropsia. Vogt thinks that this phenomenon is identical with the erythropsia which was described by Fuchs and regards it as a phase of an after-image He has produced it by looking at a light from which all red rays had been filtered by a solution of erioviridin. Vogt is of opinion that erythropsia is the red phase of the after-image of a white illuminated surface.

In the discussion which followed Vogt did not receive any support; it was pointed out that he was dealing, not with true erythropsia, but with after-images. Schanz pointed out that ultra-violet light causes fluorescence of the lens which remains visible for some hours after exposure. This fluorescence shows that the lens to some extent filters off the ultra-violet rays and they never reach the retina. If, however, the lens be absent or the rays are too intense to be completely excluded, the ultra-violet rays act upon the retina and give rise to erythropsia. T. HARRISON BUTLER.

VII.—DISTURBANCES OF ADAPTATION.

(1) **Parsons, J. Herbert.—Night Blindness.** *Lancet*, February 22, 1908.

(2) **Heinrichsdorff, Paul—The disturbance of adaptation and of the visual field in hemeralopia.** (**Die Störungen der Adaptation und des Gesichtsfeldes bei Hemeralopia.**) v Graefe's *Archiv f. Ophthalmologie*, Bd. LX, 3 Heft, Juli, 1908.

(3) **Stargardt, K.—On the pathology of dark-adaptation.** (**Zur Pathologie der Dunkeladaptation.**) *Bericht der Ophthalmologischen Gesellchaft zu Heidelberg*, 1908, p. 213 (Volume published in 1909).

(1) **Parsons** (London) in a clinical lecture discusses (1) the various forms of chronic night blindness, namely, that associated with pigmentary retinitis, which is a progressive form; hereditary stationary chronic night blindness,

which is the type so fully investigated by Nettleship; night blindness which is at first progressive but may afterwards become stationary, the type associated with syphilitic pigmentary retinitis. (2) Acute night blindness which nearly always depends upon malnutrition. It is found especially in badly-nourished children, many of whom present conjunctival xerosis. It must not be forgotten that xerosis may exist without night blindness, and there is no inherent relationship between them other than a common cause. Parsons quotes Nettleship's opinion that the lesion is peripheral (*i.e.*, as regards the nervous system). Nettleship found that a sailor who suffered from it could, by covering up one eye during the daytime, obtain sufficiently good vision at night to carry on his duties. "It would appear therefore, that malnutrition acts by lowering the vitality of the retina in such a manner that the process of repair is delayed." (3) Night blindness associated with jaundice. In most of them there are no ophthalmoscopic appearances, although in some cases pigmentary changes of slight degree have been found. Bile salts, it may be remembered, dissolve visual purple. ERNEST THOMSON.

(2) Physiological experiments by Piper show that the adaptation of the retina for light follows a very regular course. It increases very slowly during the first ten minutes, rapidly within the next twenty minutes, and extremely slowly afterwards to about 1,500 - 8,000 times the initial limit of perception. **Heinrichsdorff** repeated these experiments in cases of hemeralopia and finds various anomalies of the error of adaptation, which he records in tabular form. He states that the concentric contraction of the fields taken in subdued light, generally thought characteristic for hemeralopia, is far less frequent than the annular scotoma, though this latter anomaly requires careful testing for its detection. It is only in very old cases that the peripheral part of the field is completely gone. He thinks that annular scotoma is a certain proof of hemeralopia and due to lesions of the rods of the retina. R. GRUBER.

(3) **Stargardt** (Strasburg) pointed out that our exact knowledge of the pathology of dark adaptation is extremely small. Almost certainly, the phenomenon is a function of the rods, and probably the visual purple is intimately associated with the physico-chemical changes which alter the sensitiveness of the retina. The only researches upon the behaviour of the visual purple in pathological processes are due to Andogsky (von Graefe's *Archives*, Bd. 44). This author found that visual purple could only be detected in a detached retina when the eye had been kept in the dark before the detachment took place and had not subsequent to the commencement of the detachment been again exposed to the light. If the retina were exposed to light the purple was bleached and not again regenerated, showing that the visual purple could only be re-formed when the retina was attached to the choroid.

Parinaud has suggested that the hemeralopia in icterus is due to solution of visual purple in the bile salts which circulate in the blood, the resulting deficiency of the purple in the retina giving rise to night-blindness. Stargardt carried out an experimental research to determine whether the visual purple really is so influenced by icterus. Artificial jaundice was produced in rabbits by ligaturing the ductus choledochus. As soon as a well-marked icterus of the tissues was produced, the animal was killed, and the posterior hemisphere of the eyes placed in 5 per cent. solution of potassium hydrate for twelve hours. All manipulations were carried out in red light. The papilla was then punched out and the retina detached. It was rapidly compared in daylight with a retina from a normal rabbit. The amount of visual purple in the two retinæ was found to be the same—the icterus had not given rise to any diminution. Bleaching took place in the same time and manner in both. The author

found that the visual purple was regenerated as rapidly in the jaundiced as in non-jaundiced rabbits.

The experiments show that icterus has no action upon the visual purple in the absence of changes in the pigment cells.

In the discussion which followed the reading of the paper, Hess said that he had detected no hemeralopia in hens whose gall-ducts had been ligatured. Hess has also published a research on dark adaptation in day birds whose retinæ contains no visual purple. He thinks the part visual purple takes in adaptation to varying intensity of light has been much exaggerated.

T. HARRISON BUTLER.

VIII.—THE VISION OF DAY AND NIGHT BIRDS.*

Hess, C.—Investigations into the vision and pupil reactions of day birds and night birds. (Untersuchungen über das Sehen und über die Pupillenreaction von Tag- und von Nachtvögeln.) *Archives f. Augenheilkunde*, Bd. LIX, Heft 2, Februar, 1908, S. 143-167

Hess' researches into the vision of day birds, such as the hawk (*falco timmunculus*) and the buzzard (*buteo valgaris*), show that their colour vision corresponds pretty closely to that of a man wearing reddish-yellow glasses, *i.e.*, colours of short wave length ; violet and blue are not perceived. This is possibly due to the presence of coloured oil-globules in the cones. The spectrum seen by these birds is slightly longer when their eyes have been accustomed to darkness than in bright light. As regards the rate of adaptation to reduced intensities of light, this appears to be slower than in the human subject, but the range is the same. Hess finds that night birds, like the owl (*otus vulgaris*), do not "shun the light" in the popular sense of the term. They see pretty well, in fact much better, in daylight than is generally believed. Their spectrum extends a little further towards the blue than in day birds, a fact which may be due to the circumstance that the oil globules in the retina of night birds are of a lighter colour. At night, the owl does not see any better than man. The adaptation to darkness proceeds very rapidly in these birds during the first half hour, and practically reaches its maximum during this time. Hess also investigated the light reflex in birds. He finds that the pupils of day birds which have been kept in darkness, react more quickly to reddish-yellow and yellow light, whereas, in night birds under the same conditions, the pupil reflex is most brisk in yellowish-green and green light. Further, the pupils of day birds as well as night birds which are brought from daylight into a dark room, show no light reflex for some time ; in the case of day birds for some minutes, in night birds for half an hour or more. Afterwards they react very well. This shows that these birds are endowed with a pupillo-motor adaptation to light. PERCIVAL J. HAY.

IX.—INJURIES TO THE EYE BY LIGHTNING AND ELECTRICITY.

(1) **Terrien, F.—Cataract from electric shock. (Cataracte par décharge électrique.)** *Archives d'Ophtalmologie*, novembre, 1908.

(2) **Coullaud.—Eight cases of electrical ophthalmia. (Huit cas d'ophtalmie électrique.)** *Archives d'Ophtalmologie*, janvier, 1909.

*For other abstracts see THE OPHTHALMOSCOPE, 1908, p. 204.

(3) Dor, Louis.—An industrial accident, severe electric shock, partial atrophy of the right optic nerve, left-sided cataract, incapacity for work. (Accident du travail: electrocution, atrophie partielle du nerf optique droit, cataract O.G., incapacité de travail.) *La Clinique Ophtalmologique*, 10 mars, 1909.

(4) Ayres, S. C.—Lightning burn of the eye. *American Journal of Ophthalmology*, April, 1909.

(5) Roche, Charles.- A note on two electric cataracts. (Note sur deux cataractes électriques.) *Annales d'Oculistique*, mai, 1909.

(6) Le Roux, H. and Renaud.—On a case of ocular photo-traumatism by electric light. (Sur un cas de photo-traumatisme oculaire par la lumière électrique.) *Archives d'Ophtalmologie*, juin, 1909.

(7) Le Roux, H.— Cataract produced by an electric shock. (Cataracte par décharge électrique.) *Archives d'Ophtalmologie*, août, 1909.

(1) Accidents to the eye from electric discharges are rare. The symptoms include injection of the conjunctiva, photophobia, and blepharospasm, together with functional disturbances of variable intensity. These symptoms seldom last long, and recovery is almost the rule. Cataract resulting from the passage of current through an individual has been reported by Brixa (*Klin. Monatsbl. f. Augenheilkunde*, November, 1900), Desbrières and Bargy[1] (*Annales d'Oculistique*, 1905, p. 118, T. CXXXIII), and Bistis[2] (*Zeitschrift f. Augenheilkunde*, 1906, p. 525). To these cases **Terrien,** of Paris, adds another in a man, aged 26 years, employed as an electrician on the Paris Underground Railway, who received a current of 550 volts in the course of his work. He was unconscious for a couple of hours after the accident. When examined seven days later, Terrien found, in addition to burns about the face, slight photophobia and diffuse injection of the conjunctivæ. R. V. = 1/3. L.V. = 1/2. Fundus oculi and visual fields normal. Sight improved during the following weeks, and the patient was discharged twenty-five days after the accident. Sixty-five days later, however, he returned with R.V. 1/10—due to incomplete subcapsular cataract. The other eye, the sight of which was 2/3, showed no such changes. The cataract became complete in the course of a few weeks. Briefly, then, the cataract appeared upwards of two months after the shock, remained unilateral, and speedily reached maturity. SYDNEY STEPHENSON.

(2) **Coullaud,** of Paris, relates eight instances of so-called "electric ophthalmia," observed in firemen (*sapeurs-pompiers*). As the result of a short-circuit, two parallel copper cables, 84 cm. in section, carrying a current of 550 volts, became fused, and a voltaic arc, 65 cm. long, was formed between them. The men remained near this dazzling light for periods that varied from a few minutes to forty-five minutes, some being as close as half a metre to the emanations. Some twenty-eight hours afterwards, Coullaud was summoned to see several of the men, who complained of violent pain in the eyes. They were suffering, in fact, from "electric ophthalmia." The author gives particulars of each of these cases, eight in number, and then sums up the chief points somewhat as follows:— (1) Symptoms fell into two classes: (a) intense conjunctivitis, and (b) intense conjunctivitis, along with signs of irritation of the retina and uveal tract, as shown by photopsia, luminous *mouches*, and a sensation like fog or smoke in front of the eyes. The latter cases were associated with ophthalmoscopic signs—dilatation of the retinal veins and contraction of the retinal arteries,

1. For abstract see THE OPHTHALMOSCOPE, 1905, p. 618.
2. For abstract see THE OPHTHALMOSCOPE, 1908, p. 52.

together with a kind of passive congestion, as it were, of the fundus oculi. (2) Cocaine, 5 per cent., rapidly relieved the first group of symptoms, but was not so efficacious in the second. (3) The severity of the affection was inversely proportional to the distance which separated the subject from the electric arc, and directly proportional to the duration of exposure to the rays. (4) Between exposure and symptoms there was a latent period, varying from 7½ to 20 hours, and the longer the latent period so much the milder were the symptoms. SYDNEY STEPHENSON.

(3) **Dor's** (Lyons) patient was working in the neighbourhood of a conductor carrying current at 13,400 volts. He was "electrocuted" but recovered under artificial respiration. The current had entered at the right parietal region, as indicated by a burn. The primary ocular symptoms were tenderness and photophobia referred to the right eye, the left being almost normal. Then came on hæmorrhagic iridocyclitis and hyphæma of left eye, while the right seemed to recover. The left eye recovered from the acute iridocyclitic attack, but eventually a partial cataract developed, while the optic nerve of the right side became partially atrophic, leading to a wedge-shaped defect in the visual field. The clinical signs correspond to the experimental results obtained by Hess and Kiribuchi and others. Hess and Kiribuchi in 1900 invariably found in animals which developed cataract through electric shock, intense congestion of the ciliary processes and sometimes hæmorrhages. The cataract may be quite late in appearing. Vossius noted it at the eighth week, Laker, Downar, and Pagenstecher from the sixth to the tenth month, while Leber saw it supervene three years after the accident. As to the right eye, lesions of the optic nerve by lightning are as well-known as those of the lens. The case is an important one in view of our own Workmen's Compensation Act. ERNEST THOMSON.

(4) **Ayres** (Cincinnati), after recounting some of the known eye injuries from lightning, reports a case where a severe shock brought about the following eye conditions.—There was severe pain in the eye and eyelids; the latter were red, swollen, and œdematous. The upper half of the cornea was hazy, resembling the appearance of an eye with acute glaucoma. There was no iritis and no abnormal tension. Cold applications and cocaine were ordered. Two days later there was deep scleral injection. Three days later leeches were applied, as the pain persisted; they relieved the pain. The swelling of the lids subsided and the cornea cleared up. A month later V. was practically perfect. ERNEST THOMSON.

(5) The patient, a man aged 40, received a shock on his left side from an electric current of 75 ampères and 5000 volts, which rendered him unconscious for half-an-hour and burnt his left arm and cheek so severely that the entire inferior maxilla was laid bare, even the periosteum being destroyed. For a month the patient did not notice anything wrong with his eyes, but then a mist came over the left eye, the sight of which progressively failed, and was quite lost in three weeks. A week after the mist was noticed over the left eye the right began to fail, and its sight was also lost in about 3 weeks. When first seen by **Roche** (Marseilles) three months after the accident, the patient had in each eye what looked like a mature white cataract, with a number of more intensely white spots, the size of small pin heads, mostly in the equatorial region; there was practically no anterior chamber, but the iris reacted well, and the projection of light was perfect. The pupil having been fully dilated with atropine, the right lens was extracted, when it was found to have the consistence of a transparent lens, and by no means the white colour that would have been expected from the clinical appearance. The eye healed well, and on examination, the lens capsule was found to be very white and

absolutely opaque, but there was a small hole in it, through which the patient got a vision of half normal with a + 11D. lens. Three days after the operation on the right eye, there was a slight attack of glaucoma in the left which yielded to myotics.

In a recent article Terrien (see above) recorded a case similar to the one under consideration, and collected three others from the literature of the subject. These six cataracts were all white, and did not commence for some weeks after the accidents, but then developed rapidly, although two of them did not become complete. In two cases the cataracts were extracted, and in each of these the corrected vision after operation was half normal.

The author considers that these cataracts are due to destruction of the epithelium of the lens, such as has been experimentally produced by Hess in the eyes of frogs by discharges from a Leyden jar, and not, as has been suggested, to tearing of the anterior capsule (Yvert), the action of intense light (Himly), coagulation of albumin from catalytic action (Lebert), or irido-cyclitis (Vossius). R. J. COULTER.

(6) The case reported by **le Roux** (Caen) and **Renaud** (Caen) is a peculiar one.—A policeman, 40 years of age, was exposed on the night of June 4-5, 1905, to a violent storm, when after a brilliant flash of lightning, he experienced violent pricklings (*picotements*) in his eyes, a sensation as of foreign bodies in the conjunctival culs-de-sac, and all objects appeared to be of a red colour (erythropsia). These symptoms were followed in the course of a few hours by violent pain in the frontal and super-ciliary regions, by redness and swelling of the eyelids, intense inflammation of the conjunctiva, photophobia, blepharo-spasm, and blindness. The cornea presented diffused interstitial cloudiness. The iris became of a greenish colour. The pupils reacted badly to light. The intra-ocular tension was normal. During the two weeks which followed the accident, cloudiness of the media precluded ophthalmoscopic examination. By focal illumination, however, a peculiar grey blotch (*piqueté*) could be seen to be present on the anterior capsule of the lens. On June 16th—eleven days after the accident—the patient could recognize the hand at a distance of one metre. A week later, R.V.=1/10, and L.V.=1/8. The corneæ were clearer. There was still intense photophobia and watering of the eyes. The optic discs could be seen as through a thick veil. Opacities were present in the anterior layers of the vitreous humour. On August 11th—*i.e.*, upwards of two months after the accident—R.V.=1/3. and L.V.=1/2. Vitreous opacities still present. On January 12th, 1906, sight as noted, photophobia, vitreous opacities, optic discs and tension normal, pupils reacted feebly to light. Although nearly three years have passed since the injury, the patient's state shows little improvement. There is still a degree of photophobia, and each vitreous is cloudy.

SYDNEY STEPHENSON

(7) A man, of 28 years, while engaged at his work in an electric station, received a current of 2,800 volts, which rendered him unconscious for about half-an-hour. For four months after the accident he was almost deaf on the left side. Nothing wrong was noticed with the sight until three months had passed, when the patient found that the vision of the left eye was affected. The sight was completely lost, without pain or inflammation, in about a year. When seen by **le Roux** (Caen), eighteen months after the injury, the left eye, the sight of which was reduced to simple perception of light, was the seat of complete cataract, resembling in appearance a diabetic cataract. At a later stage the cataract showed some tendency to calcareous changes. It should be added that although three years and a half have elapsed since the accident, the media of the other eye have remained transparent.

SYDNEY STEPHENSON.

X.—VISION AFTER CATARACT EXTRACTION.

Golesceano.—Visual acuity after extraction of cataract. (Le résultat de l'acuité visuelle après l'extraction de la cataracte.) *Recueil d'Ophtalmologie*, juin, 1909.

Golesceano (Paris) classifies the results of his operations in 100 cases of cataract, which included 68 physiological mature senile cataracts, 6 cataracts with high myopia, 3 congenital cataracts, 2 cataracts in diabetics, and 1 traumatic cataract.

The visual acuity obtained after extraction—some with iridectomy and others without—was as follows :—

$\frac{6}{6}$ —no case.
$\frac{6}{9}$ —3 per cent.
$\frac{6}{12}$ —13 per cent.
$\frac{6}{15}$, $\frac{6}{24}$, $\frac{6}{36}$—11 per cent. in each case.
$\frac{6}{48}$—15 per cent.
$\frac{6}{60}$ and less—27 per cent.

Taking all down to $\frac{6}{60}$ as satisfactory, he estimates his successes at 64 per cent.

Secondary cataract appeared in one case out of eight of the combined operations, and 1 in 6 of the simple extractions.

Twenty-one of his cases developed secondary cataract, 11 of these were satisfied with their vision after the first operation; 10 were needled within 1 to 12 months after extraction, with the following results :—

Five, no improvement of vision.

In the other five cases vision improved from $\frac{1}{6}$ to $\frac{1}{2}$, $\frac{1}{4}$ to $\frac{1}{3}$, and from $\frac{1}{2}$ to $\frac{2}{3}$.

No complication, such as cyclitis and detachment of the retina, was observed after operation for capsule. Golesceano does not think that vision will gradually diminish when the secondary cataract is not needled. The 11 cases which refused operation retained their vision ($\frac{4}{50}$ to $\frac{1}{4}$) for several years.

Among the causes of failure after operation, Golesceano records 12 cases of gradual failure of vision coming on occasionally within a few months, but generally within a few years (2 to 10) after the primary operation. There was no opacity of the media in these cases, and in five of them there was no lesion of the fundus. The other seven cases showed pallor or incomplete atrophy of the disc or peripapillary atrophy of the choroid. Other complications met with were :—iridochoroiditis (2 cases), detachment of the retina (6 cases), and glaucoma (6 cases).

The cases of cataracts with high myopia did tolerably well; four of them attained vision varying from $\frac{1}{7}$ to $\frac{2}{3}$. The diabetics acquired vision of $\frac{1}{7}$ to $\frac{1}{10}$. The two patients operated on for congenital cataract had only enough vision to enable them to go about. One case of traumatic cataract and a case in which the lens was extracted in its capsule had vision of $\frac{1}{2}$.

J. Jameson Evans.

XI.—RARE COMPLICATIONS OF ZONA OPHTHALMICA.

Fage.—Rare Complications of Zona Ophthalmica. (Complications rares du Zona Ophtalmique.) *Recueil d'Ophtalmologie*, juillet, 1909.

Among the rare complications of herpes ophthalmica recited by **Fage** are :—Interstitial keratitis without any lesion of the corneal epithelium, iritis

with or without keratitis, irido-cyclitis with hypertension, partial or complete oculo-motor paralysis, and optic neuritis. The paralytic symptoms are very varied. The whole of the third nerve may be involved, or ptosis or mydriasis may be the solitary symptom. It is exceptional to find the fourth or the sixth nerve involved. In Higgens's case all the ocular muscles were paralysed. As a rule, recovery is complete, but it is often prolonged over several months; on the other hand, the paralysis may disappear in a few days.

Optic neuritis is liable to proceed to atrophy. These symptoms generally appear within a few days after the onset of the eruption, but they may be delayed for two or three weeks.

The symptoms are ascribed by Fage to the infective or toxic character of the disease. These infective or toxic substances set up irritative changes in the meninges, the ganglia, and peripheral nerves. Histologically, these changes are shown by spinal lymphocytosis, swelling of the peripheral nerves, with breaking up of the myelin and leucocyte infiltration. The Gasserian ganglion is inflamed.

As regards treatment, Fage finds that the constant electric current exercises an analgesic action on the neuralgic element, and a favourable electrolytic effect on the vesicular eruption, whilst it tends to combat the nervous atrophy which is liable to succeed the inflammatory changes. J. JAMESON EVANS.

XII.—TRAUMATISM AND INTERSTITIAL KERATITIS.

Ronnaux, Louis. — Traumatism in interstitial keratitis (Du traumatisme dans la kératite interstitielle.) *Recueil d'Ophtalmologie*, août, 1908.

Ronnaux records two instances in which typical interstitial keratitis followed injury of the eye. In one case the injury was caused by a foreign body (piece of glass), and in the other was due to a contusion.

Both patients presented signs of hereditary syphilis, and in both cases recovery was very slow—in fact, in one case, the infiltration had not cleared up a year after the onset of the keratitis. The author concludes that the injury acts as the exciting cause of the keratitis, and considers that cases of this kind recorded are too numerous to allow us to consider it a matter of mere coincidence, notwithstanding the fact that the latter view was once held by Thier and Leber in a case of Perlia's. In Perlia's case the second and uninjured eye became affected. This has also been recorded by a few other observers, and has been regarded as due to a sort of vaso-motor sympathetic disturbance, but as it is usual for both eyes to be affected successively in cases of spontaneous origin, it is hardly necessary to invoke any special explanation. J. JAMESON EVANS.

XIII.—CONICAL CORNEA.

(1) **Terson, A.—Note on the pathogenesis and treatment of keratoconus. (Note sur la pathogénie et le traitement du kératocone.)** *La Clinique Ophtalmologique*, 10 juillet, 1909.

(2) **Sauvineau, Ch.—The remote results of the different methods of treating keratoconus. (Résultats éloignés des divers traitements du kératocone.)** *Recueil d'Ophtalmologie*, août, 1909.

(3) **Antonelli, A.—Some remarks concerning the optical treatment of conical cornea. (Quelques remarques sur le traitement optique du kératocone.)** *Recueil d'Ophtalmologie*, août, 1909.

(1) **Terson's** brief note is *àpropos* the report of Parisotti to the twenty-sixth Congress of the French Ophthalmological Society, a review of which will be found on p. 714 of the present number of THE OPHTHALMOSCOPE.

ERNEST THOMSON.

(2) **Sauvineau** has been able to follow the history of two cases of conical cornea, one for thirteen and the other for fifteen years. The former was treated by surgical, and the latter by optical, means.

The story of patient No. 1, a male aged 17 years when first seen in 1896, may be epitomised as follows:—Bilateral keratoconus, more pronounced in right eye, where a 2 mm. opacity existed over the summit of the cone. The use of pilocarpine and a compressive bandage was followed a year later by sclerotomy of each eye, repeated on three occasions. Sight continued, however, to fail. Accordingly, a small iridectomy was performed on the right (worse) eye, followed by superficial cauterisation of the summit of the protrusion. After this, the cornea was perforated by the cautery. In 1899, owing to the diffusion produced by the leucoma, the mark was tattooed, and an attempt was made to diminish the dazzling effect by extending the extent of the leucoma by two applications of the galvano-cautery. In 1909 the patient, although the unaided sight of the right eye did not exceed 3/10, had attained a distinguished position as a civil engineer, and his work was hampered only by the defective vision of the left eye. The right eye looked almost normal. As to the left eye, the cornea was markedly conical, and the sight 1/100.

The second case occurred in a female of 47 years, who was first seen by Sauvineau in 1894, suffering from bilateral keratoconus. The spectacles then prescribed brought the sight of the right eye to 3/10 and of the left to 1/20. Myotics and compressive bandage for several months. In 1909 R.V. = 4/10 and L.V. = 1/16. Hence, sight had remained almost stationary for fifteen years.

According to Sauvineau, there is no uniform treatment for conical cornea. To begin with, compression and myotics should be persevered with for several years, and to that should be added, if possible, the optical correction. If the condition advances, repeated sclerotomies should be practised. If these measures fail, or if, although at a standstill, sight is very poor, the galvano-cautery should be applied, and that should be followed by an optical iridectomy. The leucoma may also be blackened, not only to lessen the diffusion of light, but also to remedy what may be a conspicuous deformity. Finally, in Sauvineau's opinion, attention should be paid to the general health.

SYDNEY STEPHENSON.

(3) **Antonelli**, of Paris, maintains that optical correction and non-operative treatment (pilocarpin and compressive bandage at night) should be first employed in cases of conical cornea—or, as he prefers to call it, conical paracentral keratectasia. He cites the case of a lady, aged 34 years, who was under his observation for about ten years. The left eye had a paracentral temporal inferior conus, 3 mm. in height, and visual acuity of 5/60 improved to 0.2 with—6 with—3.5 horizontal. The conus in the right eye was more recent, symmetrical, and 2 mm. in height. With a correction of—1 with—8 at 45° nasal the vision obtained was about 0·7. With an increase of 2 D. this correction proved satisfactory for work. For use in theatres etc., the patient wore contact glasses which she inserted even without the use of cocain and which gave the remarkable visual result of 0·8 in the left eye and 1·25 in the right. In addition to the wearing of glasses, she used pilocarpin drops and a compressive bandage at night and

there was no increase of the conus during the time she was under observation. Antonelli insists on the value of the ophthalmometer in the early diagnosis of keratoconus, and in the estimation of the refractive power of the cornea in the visual line, which so rarely corresponds with the apex of the cone. Skiascopy is also helpful in estimating the axis of the cylinder or cylinders, as in conical cornea it may be advantageous to employ two cylinders not at right angles. It may be found that the strength and axis of the cylinder chosen will vary according as the eyes are observing distant or near objects. Antonelli has found Lohnstein's "hydrodiascope" uncomfortable to wear, and unsatisfactory in use, owing to its displacement by the movements of the facial muscles and to the escape of water on to the face and down the lacrymal duct into the nose. It also practically abolishes the power of accommodation

J. JAMESON EVANS.

XIV.—BIRTH INJURIES OF THE EYES.

(1) **Brav, Aaron.—Traumatic œdema of the cornea in the new-born infant.** *New York Medical Journal*, 19th September, 1907.

(2) **Green, John, junr., St. Louis, U.S.A.—Injuries to the eyes of the child incident to instrumental delivery.** *Interstate Medical Journal*, April, 1908.

(3) **James, R. R.—Linear opacity of cornea following birth injury.** *Transactions Ophthalmological Society U.K.*, 1st January, 1909.

(2) Based upon the fact that upon the accoucheur rests the responsibility of two lives, **Green's** conclusion, that the possibility of injury to the patient's eyes can hardly weigh as a serious contraindication to the employment of obstetrical forceps whenever necessary, is correct. He justly remarks, however, that the possibility of such injury should always be borne in mind by those who attend confinement cases. C. A OLIVER.

(3) **James** (London) describes and figures a linear corneal opacity in a child of 13 years, associated with unilateral high astigmatism, which corresponds as regards history and appearances with previously described cases of corneal birth injury. ERNEST THOMSON.

XV.—INSTRUMENTS, etc.

(1) **Moretti. Hook-needle for discission, or lance-shaped synechotome. Some remarks upon the capsulo-lenticular extraction of cataract according to the method of Gradenigo.** *Annali di Ottalmologia*, Vol. XXXV, fasc 10-11.

(2) **Agababoff, A.—Scissors for cutting the optic nerve. (Ciseaux pour couper le nerf optique.)** *Archives d'Ophtalmologie*, septembre, 1908.

(3) **Terson, A.—Vast wound of the cornea, iris, and sclera; disinfection by Enesol; suture with reindeer tendon; recovery with almost normal vision.** *La Clinique Ophtalmologique*, 10 janvier, 1909.

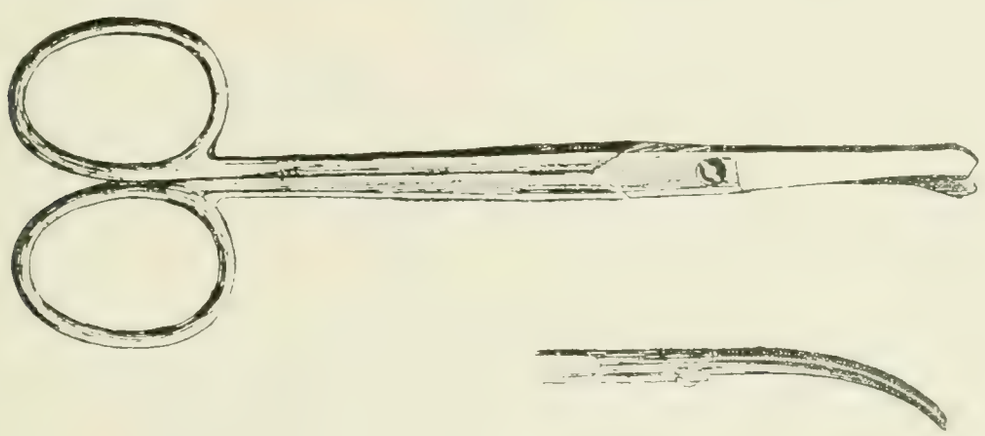
(4) **Whitaker, Edgar.—An ophthalmic vade-mecum.** *Lancet*, February 13th, 1909.

(5) **Suffa, S. A.—New suture for tucking ocular muscles.** *Archives of Ophthalmology*, May, 1909.

(6) **Dor, L.—Sclerectomy by means of the punch.** *La Clinique Ophtalmologique*, 10 juillet, 1909.

(1) The most interesting part of **Moretti's** article concerns the operation of Gradenigo (zonulotomy, total extraction of the lens). This operation, tried in the practice of Denti, at the Milan Hospital, has shown that *audaces fortuna juvat* is not an axiom . . . . especially in eye surgery. In face of the necessity of having sometimes to operate on secondary cataracts, Moretti has thought out a new instrument, a lance-shaped needle with lateral separation forming a hook, which allows it to be used also as a synechotome. The pattern of the little blade is very like the needle of Reverdin, open ready to receive the thread. One is inclined to ask if the separation does not cause a risk of catching the lips of the little corneal wound in spite of all precautions, at the moment of emergence. Taylor's needle (for incision of the iritic angle) has always given us complete satisfaction for certain discissions and synechotomies, its stem also preventing the emptying of the anterior chamber. A. ANTONELLI.

(2) The enucleation scissors designed by **Agababoff,** of Kasan, as shown by the figures, are provided with an aperture at their end, and have, besides, a stronger curve than is generally the case with such instruments. The scissors,



with closed blades, are introduced in the usual way by the side of the eyeball to the posterior pole, and the optic nerve is caught in the hollowed extremity, where its presence can be readily appreciated. Nothing more remains to be done except to open the blades of the scissors, to push the instrument a little further on, and then to divide the nerve. SYDNEY STEPHENSON.

(3) **Terson's** paper, apart from the interest of the particular case in question, is mainly taken up with the expression of views in favour of salicylarsinate of mercury (enesol), 3 per cent., as an antiseptic, and of reindeer tendon as a suture material. As the author has given at length in his work, "*Traitement des Plaies de l'Œil*," and elsewhere (*see* THE OPHTHALMOSCOPE," 1908, pp. 467 and 924), his opinions on these subjects, it seems hardly necessary to repeat them here. The particular case, which forms the foundation of this article, is sufficiently summarised in the title.

ERNEST THOMSON.

(4) **Edgar Whitaker** describes in the *Lancet* a corneal spud, in the handle of which is a recess containing a tube of ophthalmic tabloids of cocaine. "To make it convenient for the pocket, it is made the usual size of a silver pencil, and while the flat top serves admirably for a seal, the *whole instrument lends itself to general purposes of various utility* without impairing its

efficiency, and gives excuse for its constant presence." The italics are ours. One can imagine the "general purposes," and wish that the inventor had provided further space in the handle (!) for some method of sterilizing this *multum in parvo* needle. ERNEST THOMSON.

(5) **Suffa** has devised an ingenious stitch for tucking ocular muscles, for which he claims the following advantages:—(1) accurate measurement of the amount of adjustment (a myometer is used fitted with a millimeter scale set at the number of millimeters of shortening required; Suffa found in 8 cases of exophoria and divergence of high degree that 1 mm. of shortening was required for 4° of error), (2) absolute reliability in holding the muscle where placed, (3) suture properly placed, avoiding torsion, (4) a single removable silk suture giving firm union, (5) simplicity of operation, (6) ability to correct large errors without disturbing primary tendinous attachment. The steps of the operation will be best understood by reference to Suffa's article, where they are described with great lucidity, while numerous clear diagrams completely remove any lingering obscurity left by the explanation.

ROSA FORD.

(6) **Louis Dor**, of Lyons, after speaking of the value of Vacher's punch for posterior sclerectomy, suggests that its use in anterior sclerectomy, as a finished operation for glaucoma, renders the formation of a permanent subconjunctival fistula more easily accomplished than by the scissors operation of Lagrange. "I do not intend to break lances in favour of sclerectomy, nor do I desire to rival M. Lagrange. I merely desire to make known an operative *technique* which I believe to be more easy of execution than that described by M. Lagrange and M. Barbadault." The operation, which Dor describes, consists in incising the cornea (making a conjunctival flap), but without bothering to make the incision scleral and bevelled. With the punch a tongue-like portion is bitten off from the posterior lip of the incision, not from the anterior lip. In doing this, the male blade is engaged in the corneo-iridic angle, and presses against the bottom thereof. If a hernia of the iris takes place in the hole thus formed, it can be resected.

Dor's reason for preferring this operation to that of Lagrange is shown in the following quotation: "The operation of Lagrange is somewhat difficult of execution. If one only had to operate upon uninflamed eyes, with normal tension, one could usually succeed in bringing out the knife at 2·5 mm. from the edge of the cornea, but, unfortunately, glaucomatous eyes are more difficult to operate upon, because often the anterior chamber has disappeared, the patient suffers pain, and because vascular congestion causes, before the section is complete, a little subconjunctival hæmorrhage, which may chance to prevent one seeing the exact situation of the knife; moreover, the penetration of the aqueous under the conjunctiva after the counter-puncture has a similar effect. Then, if the incision be made too far forwards, one does not get sufficient bevelling, and if too far back, the ciliary body may be wounded. For all these reasons I believe that Lagrange's operation is difficult, and that sclerectomy has everything to gain by being simplified in *technique*." The difference between excising the anterior flap with scissors and excising the posterior flap with the punch is that the incision can be made much farther forwards, and there is no fear of wounding the ciliary body.

ERNEST THOMSON.

XVI.—OPHTHALMIA NEONATORUM.

(1) **Burnier, R.—Ophthalmia neonatorum.** (L'Ophtalmie du Nouveau-Né.) *Gazette des Hôpitaux*, 1 mai, 1909.

(2) **Gehrung, Julien A.—Ophthalmia neonatorum.** *New York State Journal of Medicine*, May, 1909.

(3) **Dunn, Percy.—Purulent conjunctivitis in infancy.** *Lancet*, 3rd July, 1909.

(4) **Harry, Philip A.—Notes on Ophthalmia Neonatorum.** *Hospital*, July 31st, 1909.

(1) **Burnier**, of Paris, has a comprehensive review dealing with ophthalmia neonatorum, which he describes under the two heads of: (1) blennorrhagic and (2) non-blennorrhagic ophthalmia. As regards congenital ophthalmia, Burnier admits that in some instances the gonococcus is able to penetrate the unruptured fœtal membranes. Gonococcal ophthalmia cannot always be recognised by clinical signs alone, inasmuch as attenuated types of inflammation occasionally occur. When due to gonococci, however, the malady is always serious, on account of the possibility of complications. In one-quarter of the cases associated with the gonococcus the cornea is affected (Druais), and such affections are not infrequently bilateral (according to Groenouw's figures, three times in ten cases). The only certain way to differentiate the catarrh determined by the prophylactic use of silver nitrate is by means of a bacteriological examination of the discharge from the eye. The other characteristics, such as the date of appearance, the presence or absence of corneal complications, and the duration of the affection, possess merely a relative and secondary importance. The same considerations apply to non-blennorrhagic ophthalmia. Amongst these, cases where no micro-organisms exist are not uncommon. Thus, in 165 cases, Augé found no microbes in 77, and in 63 cases Druais in 31. Some of these "amicrobic" forms, as they are called, may be due to an infection, the micro-organism of which is as yet unknown. That the disease is of infective character, however, is shown by its bilaterality. Some of the cases, a number estimated by Morax at 1/20th, are essentially of syphilitic origin. Burnier protests against the assumption that cases of amicrobic nature are due to the carelessness of the midwife or nurse. As regards Credé's method of prophylaxis, the author quotes the figures of Credé, Haab, and Pinard. Burnier estimates that in France there are 3,000 or 4,000 persons who have been blinded by ophthalmia neonatorum, and that a charge of about 5,000,000 francs per annum is thereby thrown upon the *Assistance Publique*. Among that number Burnier does not count those who have lost one eye only from the disease. **Curative Treatment.**—The main dependence must be placed upon the cauterisation once or twice a day, according to the intensity of the inflammation, with a solution of silver nitrate, the strength of which must not be inferior to 1 : 50 and not superior to 1 :30. Between the applications, the eyes must be kept clean by the frequent use of boiled water, artificial serum, oxycyanide of mercury (1 : 8,000), potassium permanganate (1 : 3,000), formol (2: 1,000), or naphthol (1 : 5,000). With respect to the treatment of corneal complications, there are two schools, of which the first reprobates the use of silver nitrate under those circumstances, whilst the second advises its continuance. Iodoform ointment is recommended. The instillation of a collyrium of methylene blue (1 : 400) sometimes appear to hasten cicatrisation. Non-blennorrhagic cases may also be treated with silver nitrate,

or if symptoms be slight, they may yield to protargol, argyrol, or zinc sulphate. Antitoxic serum should be employed when the inflammation of the conjunctiva is associated with the Klebs-Löffler bacillus.

SYDNEY STEPHENSON.

(2) **Gehrung**, of New York, has a long article upon the several aspects of ophthalmia neonatorum. He urges the necessity of a definite plan of campaign on the part of medical men and midwives. Prophylaxis should be obligatory, for "this is not a time to consider whether we may hurt someone's feelings or not." "The State and ourselves have a duty to perform, and the people the right to demand it." As regards the damage to sight done by infantile ophthalmia, Gehrung remarks: "It is only the poor dependent blind that are enumerated in our statistics. Neither do the afflicted of rich parents come under our notice. These people do every thing in their power to keep it secret.' The author conveys the impression that mothers are commonly affected with ophthalmia from their children. This, of course, occurs now and then, but in England, at all events, it is certainly not a common event. Its rarity, indeed, was used as an argument by the responsible Minister in the British House of Commons as recently as March 17th, 1908, against including ophthalmia neonatorum in the list of compulsory notifiable diseases. Gehrung advises two applications of 1 per cent. silver nitrate (the first as soon as the baby's head is born, and the second after the baby has been washed) as the prophylactic to be generally adopted. The second application of the silver salt is to be followed by a little saline solution or by the application to the eye of adrenaline hydrochloride, 1:5000. This latter strikes us as somewhat superfluous if the author's statement, made earlier in the communication, be correct, namely, that "the action of the silver is but momentary, being quickly neutralized by the chlorides of the tears." The general view, of course, is that tears are absent from the eyes of a newly-born child. SYDNEY STEPHENSON.

(3) In a letter to the Editor of the *Lancet*, **Dunn** (London) points out that 1 grain to the ounce of silver nitrate is a very useful strength for treatment. One per cent. is five times that strength. The former solution can be given to the mothers for home use, and by carrying out the instructions they cure the babies themselves, provided the corneæ are intact at the time of the first visit, and no matter of what virulence the infection may be. Referring to the admission of mothers and babies for in-patient treatment at Liverpool, Dunn remarks that if this is necessary for the mothers of Liverpool it is perfectly unnecessary for the mothers of the district of West London who come with their babies to the West London Hospital. To the reviewer, the jibe appears uncalled for and quite unjustifiable, since affection of the cornea is such a common complication. ERNEST THOMSON.

(4) **Harry** (Leeds) speaking from his experience at the Leeds General Infirmary, believes that ophthalmia neonatorum has a seasonal incidence, the greatest number of cases occurring in spring and summer. For the year ended June 30th, 1909, there were 29 admissions, and 21 of these patients had not been attended by a medical practitioner. First and second children were those most often attacked by the disease. With few exceptions, it was found that the mother had suffered from a purulent vaginal discharge for some time before the birth of the child. Among the 29 admissions complicated labours were rare, as evidenced by the fact that 73 per cent. of the labours had been conducted by midwives. "In the majority of these cases," writes Harry, "no history could be obtained of any prophylactic measures having been taken to prevent infection of the child's eyes, not even the precaution of cleaning the head and face before the body." As regards treatment, at Leeds

mothers are always strongly advised to enter hospital with their infants, especially when the baby is brought to the hospital by its mother. Harry makes the important observation that infants admitted alone rapidly lose ground, becoming pale and emaciated. "In the last five years there have been six deaths among the children of this class admitted without their mothers." "It is frequently found, too, that after their return home they thrive badly, owing to convulsions and intestinal troubles." The author advocates external canthotomy, in order to facilitate the proper cleansing of the conjunctival sac. As lotions, he employs glycothymolin (1 in 5), boric acid (2 drachms to the pint), and potassium permanganate (1 in 5,000). The conjunctiva is painted with silver nitrate, twenty grains to the ounce. In addition to this, argyrol drops (20 per cent.) are instilled every four hours. Atropine sulphate (1 per cent.) is used only when corneal complications are present. It may be noted that mercurial lotions are seldom used, not only on account of their deleterious effects upon the cornea, but also because they may produce a general intoxication. Thus, Harry has seen pallor and profuse salivation more than once in cases where biniodide lotion was employed; and he speaks of the sudden deaths of two infants from acute gastro-enteritis, due presumably to the use of strong perchloride lotion. Corneal opacities remaining after ophthalmia neonatorum are treated by thiosinamin and dionin ointment (2 per cent. to 4 per cent.) This remedy is used for many months, being varied occasionally with yellow ointment (1 per cent.). SYDNEY STEPHENSON.

XVII.—REMEDIES.

(1) **Römer, P.—The specific treatment of commencing senile cataract.** (Spezifische Therapie des beginnenden Altersstares.) *Bericht der Ophthalmologischen Gesellschaft zu Heidelberg*, 1908, p. 195 (volume published in 1909).

(2) **Cheney.—The newer silver salts as compared with silver nitrate in the treatment of ophthalmia neonatorum.** *Boston Medical and Surgical Journal*, 4th March, 1909, quoted by *Therapeutic Gazette*, 15th June, 1909.

(3) **Fox, L. Webster.—Amethyst-tinted lenses.** *Journ. American Medical Association*, 10th July, 1909.

(4) **Scott Moncrieff, Major W. E., I.M.S.—Alypin with special reference to its hitherto undescribed cycloplegic action.** *Indian Medical Gazette*, July, 1909 (XLIV, 250).

(5) **Salva.—Lead pellet in the vitreous; hyalitis with retraction; loss of vision, clearing up by injections of fibrolysin.** (Grain de plomb dans le vitré; hyalite condensatrice; perte de la vision, éclaircissement par les injections de fibrolysin.) *La Clinique Ophtalmologique*, 10 août, 1909.

(1) **Römer, P.** (Greifswald).—It is possible that in the senile metamorphosis of the human organism in consequence of disturbances of the intermediate metabolism, specific bodies arise which exert a cytotoxic action upon the lens cells, and give rise to the clinical picture of subcapsular senile cataract. If

senile cataract be a disease of metabolism and not a consequence of an irregular sclerotising process in the lens, then rather than looking to the knife to cure cataract, we should endeavour to prevent its complete development. Fortunately, it would appear that the lenses of all mammals have the same biochemical nature. Uhlenhuth has discovered this by the precipitate reaction, and by his researches on the complement binding of lens-albumins. The albumin of human lenses cannot be distinguished from that of the lenses of other mammals by any serological method.

Taking advantage of this fact, Römer has administered a preparation of lens-albumin by the mouth to patients suffering from capsular cataract, and with most gratifying results. In one patient vision rose in the right eye from 6/60 to 6/30, and in the left from 6/20 to 6/8, and after a period of eighteen months, remains at this figure. Römer has now a large number of patients under treatment at Greifswald, and is satisfied that he is obtaining real improvement. It is essential that the case be one of subcapsular cataract and not a case of cataracta punctata. The separation of the two forms cannot be made by simple examination with a lens: Zeiss' *loupe* must be employed. Cataracta punctata is not influenced by the treatment, but both the pure subcapsular variety and the mixed form are favourably influenced. In no case has the author seen any ill effect. T. HARRISON BUTLER.

(2) In spite of the admittedly greater bactericidal power of silver nitrate, **Cheney** (? or the reporter of his article) points out that for a medical man inexperienced in this class of work, who finds himself compelled to undertake the treatment of a case of ophthalmia neonatorum, protargol and argyrol have points of advantage. Notably, it is necessary to evert the upper lid in order to apply nitrate properly, and this manipulation may quite possibly lead to injury and infection of the cornea through lack of skill. Again, the cornea may be injured by too free use of the remedy. On the other hand, it requires no special experience to use a 10 per cent. protargol or a 25 per cent. argyrol solution. These remedies can be used frequently by simple instillation, and the upper lid need not be everted. ERNEST THOMSON.

(3) For over twenty years **Fox** has employed amethyst-tinted lenses constructed from old window-glass in Philadelphia, some of which (brought from England seventy-five years ago) has been turned of an amethyst hue by action of the sun. Three shades have been employed. The results of such glasses have been gratifying in those whose work is done under artificial light, as well as in cases of asthenopia. The glass has also been prescribed with relief to patients whose eyes have been exposed in X-ray laboratories. Since the amethyst window-glass is continually becoming scarcer in Philadelphia, efforts are now being made to produce the colouration by artificial means, although Fox is not yet in a position to state whether glass tinted in this way will have the same therapeutic effect as that he claims for the other product.
SYDNEY STEPHENSON.

(4) **Major Scott Moncrieff** has performed 150 cataract extractions and many other eye operations under alypin anæsthesia since 1905. Mostly, he used one and two per cent. solutions, but latterly a four per cent. solution. He has returned to the use of cocaine for cataract extractions and for iridectomies. Alypin failed to anæsthetize the conjunctiva fully. Second and third instillations caused as much smarting as the first, and sub-conjunctival injections could not be made painlessly under alypin anæsthesia. As an aid in the active treatment of trachoma, alypin was disappointing. Even the pure drug in powder had little effect in such cases, and in itself caused considerable pain. The action of alypin on the iris was slightly less than that of cocaine.

He finds that the instillations sometimes have a slight mydriatic effect—upon himself he noticed a slight cycloplegic action. The need for further investigation, by the instillation of strong solutions and by the use of the powder locally, is mentioned. By means of two grains of alypin administered by the mouth, and again by one grain hypodermically, he was able to paralyse his own accommodation completely. This paralysis apparently comes on quickly and lasts only a short time, and is unaccompanied by mydriasis. H. HERBERT.

(5) **Salva's** interesting case concerns a lady who, when out with a shooting party, received one No. 10 shot in each eye, as proved radiographically a few days later. She was not seen by Salva until seven months afterwards. At this time the left eye was a prey to iridocyclitis. Its enucleation was advised but not consented to till six months had passed. The right eye was in much better case. It had normal tension, a clear lens, and p.l. at 60 centimetres: no fundus-reflex. Mercurial treatment was first tried and resulted in p.l. at 6 metres after three months. This had deteriorated to 2 metres after another three months, and improved again to 4 metres after the other eye had been excised. Fibrolysin (Merck) was then tried in a dose of 2 cc. of solution every two or three days, by intramuscular injection. In a couple of months V.= $\frac{1}{10}$. Visual field, now chartable, showed 40° above, 45° below, 55° outwards, 25° inwards. The nasal portion of the fundus, including the disc, was visible and seemed fairly normal. A greyish-white vitreous opacity in which the pellet was embedded presented an insuperable obstacle to examination of the upper and outer portions. The injections were continued for five months longer, by which time sixty-five had been given. Shortly afterwards V.= $\frac{2}{10}$, field as at last note (above). The author speculates as to how long the improvement will last in view of the usual result of foreign bodies lodged in the vitreous, and proposes to continue the occasional use of fibrolysin. He also wonders why the lead pellet ever remained in the *upper* part of the vitreous. ERNEST THOMSON.

XVIII.—OPERATIONS.

(1) **Albertotti.—A contribution to the treatment of dislocation of the lens into the anterior chamber.** (**Contribuzione alla cura della lussazione del cristallino nella camera anteriore.**) *La Clinica Oculistica*, April, 1907.

(2) **Grimaldi, E.— The fundamental principles of treatment of cicatricial entropion.** *Annali di Ottalmologia*, Vol. XXXVI (1907), fasc. 12, p. 927.

(3) **Cramer, E.—Successful surgical treatment of a circumscribed vitreous abscess.** (**Chirurgische Heilung eines umschriebener Glaskörper-Abscessus.**) *Centralbl. für prak. Augenkeilkunde*, Juni, 1907,

(4) **Alonso, Antonio.—Indications for suture of the cornea in cataract extraction.** Third Annual Meeting of the Mexican Ophthalmological Society, and *Anales de Oftalmologi*, Enero, 1908.

(5) **Valez, Daniel.—Five more cases of implantation of fat after enucleation.** *Anales de Oftalmologia*, Mayo, 1908.

(6) Thilliez.—The treatment of cysts of the iris by electrolysis. (Traitement des kystes de l'iris par électrolyse.) *Archives d'Ophtalmologie*, septembre, 1908.

(7) Frenkel, H.—Relapsing hæmorrhages following iridectomy. (Hémoragies récidivantes consécutives à l'iridectomie.) *Recueil d'Ophtalmologie*, 19 septembre, 1908.

(8) Bettremieux. — Simple sclerectomy. (La sclérectomie simple.) *L'Ophtalmologie Provinciale*, T.V., p. 141, septembre, 1908.

(9) Aurand.—Paralytic convergent strabismus treated by a new method of capsular advancement (resection of the capsule) combined with muscular advancement by Motais's transverse suture. (Strabisme convergent paralytique traité par un nouveau procédé d'avancement capsulaire (résection de la capsule) combiné à l'avancement musculaire par suture transversale de Motais.) *L'Ophtalmologie Provinciale*, T.V., p. 139, septembre, 1908.

(10) Didakis.—Notes on my ophthalmic practice in Egypt. (Notes sur ma pratique oculistique en Egypte.) *Ann. d'Oculistique*, T. CXL, p. 354, novembre, 1908.

(11) Schmidt, H.—Solutions of the problems of Mules's operation. (Zur Lösung des Problems der Kugeleinheilung.) *Zeitschrift für Augenheilkunde*, Januar, 1909.

(12) Mendel, F.—Severe glaucoma caused by a dislocation of the lens: cured by operation. (Schweres Glaukom durch traumatische Linsenverschiebung: Operation geheilt.) *Centralbl. f. prak. Augenheilk.*, Januar, 1909.

(13) Hirschberg, J.—Traumatic implantation of an eyelash, with localised suppurative iritis, cured by operation. (Traumatische Einpflanzung einer Wimper, umschriebene eitrige Iritis: Heilung durch Ausziehung der Wimper und Iris-Ausschneidung.) *Centralb. f. prak. Augenheilk.*, Januar, 1909.

(14) Pascheff, C.—A new method of performing tarsorrhaphy. (Nouvelle méthode de Tarsorrhaphie.) *Archives d'Ophtalmologie*, janvier, 1909.

(15) Jameson, Chambers.—Replacement of incarceration of the iris by traction from within the anterior chamber. *Archives of Ophthalmology*, January, 1909.

(16) Hawley, Clark W., and Campbell, John F. (Chicago.)—Symblepharon and false pterygium from fireworks burn and successful operation. *Journal of Ophthalmology and Oto-Laryngology*, 1909, Vol. III, p. 85.

(17) Sauvineau, Ch.—The disadvantages of tenotomy and the advantages of muscular advancement in the different varieties of strabismus. (Les inconvénients de la ténotomie et les avantages de l'avancement musculaire dans les diverses variétés de strabisme.) *Ann. d'Oculistique*, T. CXLI, p. 81, février, 1909.

(18) Lindenmeyer, Otto.—Posterior sclerotomy in malignant glaucoma. (Die Sclerotomia posterior bei Glaucoma malignum.) *Klin. Monatsbl. f. Augenheilkunde*, März, 1909.

(19) **Hirschberg, J.**—A case of iridectomy, done for occlusion of the pupil after ophthalmia neonatorum, observed after 33 years. (Ein Fall von Iridectomie wegen der von Neugeborenen-Eiterung herruhrenden Pupillensperre nach 33 jahren wieder beobachtet.) *Centralb. f. prak. Augenheilk.*, März, 1909.

(20) **Stephenson, Sydney.**—A case of unilateral ptosis treated by the Motais operation very slightly modified. *Transactions Ophthalmological Society U.K.*, Fasc. 1, 1909.

(21) **Collins, Sir William J.**—Removal of a large varix of the orbit. *British Medical Journal*, 1st May, 1909.

(22) **Nance, Willis O.** — The surgical treatment of optic neuritis. *Journal of Ophthalmology and Oto-Laryngology*, Vol. III, No. 5, May, 1909.

(23) **Ellis, Edward Keith.**—Operative treatment of separation of the retina. Reports of cases treated by scleral puncture. *Archives of Ophthalmology*, May, 1909.

(24) **Fernandez, Juan Santos.** — Scleral collapse during cataract operation. *Archives of Ophthalmology*, May, 1909.

(25) **Bourgeois, A.** — Double rôle of the operation for ectropion by A. Terson's method. (Double rôle de l'operation de l'ectropion par le procédé A. Terson.) *Recueil d'Ophtalmologie*, mai, 1909.

(26) **Yvert.**—The advantage of the external curvilinear orbitotomy in a case of benign tumour or foreign bodies in the orbit. (Avantage de l'orbitotomie externe curviligne en cas de tumeur bénigne ou de corps étrangers de l'orbite.) *Recueil d'Ophtalmologie*, juin, 1909.

(27) **Nesfield, Capt. V. B., I.M.S.** — The extraction of the lens in its capsule (Smith's operation) by division of the suspensory ligament. *Indian Medical Gazette*, July, 1909 (XLIV, 249).

(1) This paper is based on three cases which were seen in **Albertotti's** Clinic at Padua. In the first case the lens of the right eye was dislocated into the vitreous, while the left lens was lying in the anterior chamber. It was decided to remove it, but at the time of operation the lens was found to have slipped back behind the iris ; the removal was performed by means of a scoop after an iridectomy upwards.

The second case had a very similar course. The third was interesting on account of the frequency with which the lens was observed to pass from one chamber to the other. It was eventually removed from the anterior. In all three cases the results were good, although a certain amount of vitreous was lost in the first two. H. GRIMSDALE.

(2) In a general review, **Grimaldi** (Naples) brings out, first, with regard to the upper and, then, to the lower eyelid, the clinical and anatomico-pathological points of view which should determine the choice of operation in each particular case of cicatricial entropion, especially in trachoma. The author insists on the excellence of the results in Scimeni's operation (transplantation of the ciliary border). A. ANTONELLI.

(3) **Cramer** recounts a curious case of a young man, aged 26 years, who had an inflammation of the right eye, more marked on the inner side and at one point a reddish streak. Pupils active and vision normal. He denied

having received any injury. A week later, the patient returned with granulations at the site of the red streak, and this time he confessed to having received an injury as he was breaking open a cartridge! and in the consequent explosion a splinter flew into his eye. In the vitreous was now found a spherical, yellow swelling springing from the inner wall of the eyeball. V. $=\frac{6}{60}$. It was clear that a bit of copper had been driven into the eye. Under chloroform, the abscess was opened, the foreign body could not be found, and the wound was closed up. Healing was perfect, and vision became normal again, and has remained so. This case is a perfect example in the human being of Leber's experiments in 1891 with metallic foreign bodies. Copper produces an aseptic inflammation with pus production, and now the foreign body, enclosed in a fibrous capsule, does no further harm. A. LEVY.

(4) Suture of the cornea in a cataract operation ought to be an exceptional proceeding; for although it facilitates cicatrization and avoids hernia of the iris, yet it deforms and produces opacity of the cornea. **Alonso** (San Luis Potosi) believes that it is indicated in: (1) certain capsulo-lenticular cataracts, with an opaque and thick capsule, when, after extracting the lens, the thick capsule remains and endangers the optical success of the intervention In such cases a previous suture of the cornea will allow the capsule to be extracted and the lips of the wound to be brought together at once; (2) trembling subluxated cataracts, with zonular alterations; (3) cataracts with hyper-tension, anterior chamber reduced, iris paretic and pupil dilated: in such cases hernia of the iris is avoided and also escape of the vitreous humor, which is so frequent. The suture ought to be fine, aseptic, and passed near to limbus and without going through the corneo-scleral parenchyma; the threads should be left from 5 to 6 days.

J. DE J. GONZALEZ.

(5) **Valez** (Mexico) brought before the Mexican Ophthalmological Society 10 cases of implantation of fat, either in the cavity of an old enucleation, or after enucleation, or after exenteration of the eye-ball. Fernando Lopez presented before the same Society 6 cases after enucleation and 12 after exenteration.

Valez now presents 5 new cases after enucleation, which, in his opinion, is when it gives the best results, as the fat is best engrafted in Tenon's capsule. In 4 cases the æsthetic result was very satisfactory after the cicatrization, which was immediate; in the others the fat became infected and melted and its sphacelated shreds had to be extracted. He thinks that in certain cases the fat may be reabsorbed, and he exhibited to the Society an anatomical specimen consisting of an eye in which exenteration and the implantation of fat had been made and which, two years afterwards, having to be enucleated on account of pain, was found void of fat. But he has seen several cases where, even after 6 years, the socket was still full and nourished.

Valez recommends the following precautions:—(1) always to remove the quantity of fat (from the gluteal region) necessary for filling the cavity, taking care, when suturing, that the fatty ball be not too much compressed; (2) to sew with silk, catgut being too quickly resorbed; and (3) to perform the operation under rigorous asepsis, and not to implant too large a volume of fat, so as to avoid strangulation. J. DE J. GONZALEZ.

(6) **Thilliez,** of Lille, treated by electrolysis a serous cyst of the iris which occupied two-thirds of the anterior chamber. The operation was repeated after an interval of about six months, since the cyst had refilled in the meantime. It had not grown again when the patient, a man aged 32 years, was examined five months after the second operation. As to the *modus faciendi*, a needle, connected with the positive pole, was passed into the cyst, and a

current of 2 milliampères was allowed to pass for a couple of minutes. On the second occasion the current commenced at 4 milliampères, and was then reduced to half that amount. Each strength was permitted to act for two minutes. It should be noted that when the patient was last seen, five months after operation, there were vitrous opacities, believed by Thilliez to be due to an irido-cyclitis set up by the cyst. SYDNEY STEPHENSON.

(7) **Frenkel** records the case of a woman, aged 65 years, with no family or personal history of clinical import, but whose irides were fixed by posterior synechiæ and whoce pupil was occupied by a grey exudate. The media and fundi were not visible, and vision was reduced to fingers at one metre. Tension practically normal in each eye, and the eyes showed no sign of inflammation. An iridectomy (extra-sphincter) was performed in the left eye. A hyphæma was found at the first dressing next day, and this gradually increased, and for a fortnight occupied half the anterior chamber. The condition was ascribed to absorption of toxic products from a uterine epithelioma from which the patient suffered, and the treatment was directed to keeping this clean and preventing septic absorption. Constitutional dyscrasias, such as diabetes, may give rise to similar complications. J. JAMESON EVANS.

(8) **Bettremieux** has performed simple sclerectomy thirty-two times and has found it always harmless and often useful. He considers that it is indicated in (1) glaucoma when iridectomy is contra-indicated because it might aggravate the condition, because the disease is not far enough advanced to justify it or because the anterior chamber is so shallow as to make the operation very difficult; (2) irido-choroiditis with synechiæ, with a view to preventing the absorption of vitreous opacities. He also claims to have had good results from the operation in two cases of localized posterior detachments of the retina and one case of extensive traumatic detachment. The author considers that it is more rational to try to promote escape of fluids from the eye by thinning the filtering membrane than by making a hole in it, and urges in favour of sclerectomy that if it fails, iridectomy can be performed subsequently. R. J. COULTER.

(9) **Aurand** (Lyons) in operating on a patient with paralytic convergent squint, having failed to get a sufficient result from a free tenotomy of the internus combined with advancement of the externus by Motais's method (splitting the tendon longitudinally and fixing the halves to sutures passed through the sclera vertically, one above and the other below the cornea) excised a piece of capsule 1 cm. broad by 1.5 cm. high and brought the edge of the remaining capsule up towards the cornea by two double-armed sutures passed vertically through the sclera 2 mm. external to the limbus and 0.5 cm. from each other and then from within outwards through the capsule and conjunctiva. The immediate result was perfect, but two months later, a convergence of 15° had returned, although the eye could be rotated 10° outwards. R. J. COULTER.

(10) **Didakis,** of Cairo, has endeavoured to simplify the *technique* of his operations and finds that excellent results can be obtained with a minimum of precautions, *viz.*, cleansing of the surgeon's hands and the patient's face and eyelids with soap and water, followed by disinfection with 1 in 2,000 solution of hydrarg. perchlorid., washing of the conjunctival sac with 1 in 5,000 solution of cyanide of mercury, and use of fresh unsterilised drops and unsterilised dressings. He performs most of his operations without assistance, but when he considers an anæsthetic necessary, as in some cases of iridectomy and in trichiasis operations, the anæsthetist helps by fixing the eye or by swabbing. Didakis considers that it is safe to perform intra-ocular operations on patients suffering from trachoma provided the disease is not in the secreting stage, but that in

such cases it is advisable to replace the bandage by protectors very soon. As a rule, he hospitalises his cataract patients, but at times he sends them home, and he mentions the case of one who, immediately after operation, rode on a donkey to his home, an hour's journey distant, without suffering any bad effects. R. J. COULTER.

(11) **Schmidt** (Wilhelmshaven) states that in five of his cases of Mules's operation previously published the result has been very good, the globe remaining in the sclera and causing no irritation. There is no evidence that the sound eye has been in any way influenced.

In recent cases Schmidt has removed the eye and then tied all the four muscles together by means of a suture passed through their respective tendons, a ball of 15.5 mm. diameter being placed within them. The conjunctiva is sutured over the muscles. The author gives an account of similar operations. Lagrange has introduced a rabbit's eye into Tenon's capsule. Others have filled the capsule with hard paraffin, but Davis has strongly objected to this material. Agar-agar has been used, but has not proved satisfactory. Prince recommends the favourite gold globe. Bartels has tried to use fat from the thigh of the patients. Elschnig has used a ball made of sunflower or elder pith, but Schmidt does not at all approve of this material—in fact, he devotes a page to criticising Elschnig and his sunflowers. He carefully avoids mentioning the nature of the balls he uses. He does not allude to Mules at all throughout the paper. T. HARRISON BUTLER.

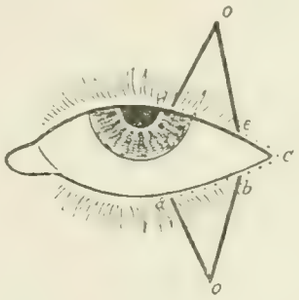
(12) **Mendel's** patient, a woman aged 32, had received a severe blow on her left eye which immediately caused total blindness. On examination two days later, both lids were hæmorrhagic, the eye injected, pupil wide and immobile. The lens was cataractous and its lower $\frac{2}{3}$ occupied the lower portion of the anterior chamber, the upper $\frac{1}{3}$ was directed backwards, and lay behind the upper portion of the iris. Under eserine and a bandage, the eye did well for five days, when suddenly the signs of acute glaucoma came on with the greatest severity. It became essential to operate at once, and this was done. A keratome was entered at the lower and inner quadrant and on withdrawing the instrument, the lens presented and was easily delivered. The eye recovered, and has now, with the appropriate glass, vision of $\frac{6}{12}$.

A. LEVY.

(13) **Hirschberg's** case is that of a man, aged 31, who received a violent blow in his left eye, a beer bottle having exploded and the patent stopper hitting him. He was seen shortly after the accident. The eye was deeply injected. At the lower and inner margin of the cornea there was a small perforating wound—some clot in the anterior chamber, and the pupil occluded by exudate. Tension was low, and the eyeball very tender. Atropine was instilled, and the eyeball tied up. Three days later a small detachment of the iris periphery in the region of the wound could be seen. Two days after that, two large opacities could be seen in the vitreous. In spite of treatment, the eye remained painful and the other eye became irritable. Nine days after the accident a very fine eyelash was discovered in the iris, reaching from the pupillary edge to the upper and inner portion of the iris. The point of implantation in the iris shows a circumscribed swelling and some new blood-vessels. The question as to operation now arose, and it was decided, first, to attempt the removal of the cilium, and, then, to excise the affected piece of iris. This was successfully carried out next day, and the eye recovered perfectly. A. LEVY.

(14) The operation devised by **Pascheff** (Sofia) is as follows.—The outer third or so of the eyelids, including the external commissure, is divided by means of an inter-marginal incision (Figure a, c, d), and this is followed by the

excision of a triangular piece from the skin of each eyelid (a,o,b and d,o,e). The tarsal edges, first vivified, are next sutured, and the operation is completed by tying d to e and a to b. SYDNEY STEPHENSON.



(15) Following Dunn's example, **Jameson** replaced a prolapse of the iris by traction backwards. Through a peripheral corneal incision, a blunt iris hook was passed and swung round the constricted neck of the iris. Gentle traction, combined with moderate manipulation outside, brought the iris into place. The anterior chamber was then irrigated with normal saline solution with a Lippincott's irrigator, the flow being from incision to wound. A 4 grain solution of pilocarpine was used for 24 hours, followed by atropine. The iris resumed its normal appearance and function within two weeks. Jameson notes the following advantages of this method of replacing an incarcerated iris, in addition to those mentioned by Dunn.—The damaging pressure of the iris from outside is obviated, the edges of the corneal wound are spared instrumental injury, posterior traction is combined with anterior manipulation, the peripheral incision diverts the flow of aqueous from the direction of the wound, thus lessening the danger of secondary prolapse, and by equalising the aqueous pressure permits the edges of the wound to meet more thoroughly, and irrigation can be complete and thorough. ROSA FORD.

(16) **Hawley,** after failure by simpler methods, in this case performed a successful skin grafting operation; transplantation of skin gives much more satisfactory results than of mucous membrane. Method: dissect carefully and cleanly all cicatricial tissue from the cornea, with the conjunctiva, leaving sclera exposed, over the area which it is proposed to graft. A very thin piece of skin—it cannot be made too thin—is taken from behind the patient's ear, or from the thigh of some young person, with a *sharp* razor. While the graft is still on the razor, trim it to size and shape, then a drop of water is placed on it and it is floated on to the sclera and fixed with two stitches. Stitches may be removed next day. The graft rapidly changes colour, and soon completely disappears, with a useful eye as regards movement and perfect cosmetic effect. HENRY L. G. LEASK.

(17) **Sauvineau's** article is a recapitulation of the arguments against tenotomy, and in favour of advancement, largely following Landolt's well-known opinions. R. J. COULTER.

(18) **Lindenmeyer** describes a case in which iridectomy for simple glaucoma was followed by the symptoms of acute inflammatory glaucoma. The anterior chamber had not re-formed on the day after the operation, and on the second day the tension was high, the cornea dull, the eye irritated and painful. All these symptoms became rapidly worse in an alarming way. On the sixth day, posterior sclerotomy was performed: the anterior chamber re-formed at once, hæmorrhage occurred into it, which, however, became gradually absorbed, and the eye was saved with a final vision of one-fourth. The operation should consist in a three to five mm. meridional section down and out, about 10 mm. from the limbus, and a slight rotation of the knife to allow of a sufficient escape of fluid. C. MARKUS.

(19) The interest of seeing the results of our operations many years after they have been done is great, and **Hirschberg** (Berlin) has reported many such results. The case here given is one of a child who, in 1876, had gonorrhœal ophthalmia, which in the left eye caused a large central leucoma with anterior synechiæ, for which an iridectomy was performed. After the eye quieted down, an opacity in the anterior capsule of the lens could be seen. In 1885 the child was seen again. There was horizontal nystagmus. Vision R = 15/40 L.V. = fingers at 2m. The left cornea slightly more transparent than formerly, the lens opacity unchanged, the coloboma clear. In 1909 this patient was seen again. Vision = R. 5/15 the same as 24 years previously, but the left eye vision had sunk to fingers at 0.75m, while the corneal opacity had become more transparent. This amblyopia can be due only to lack of use. A. Levy.

(20) **Stephenson** (London) describes and illustrates the excellent result of his operation, which consisted in dividing the superior rectus into two parts, an inner and an outer, and stitching the latter into the upper lid between skin and orbicularis, on the one hand, and the tarsus, on the other. In children it becomes a very difficult task to resect, as recommended by Motais, a central strip of the superior rectus tendon. Hence Stephenson's modification of the original Motais operation. Ernest Thomson.

(21) A woman, aged 42 years, suffered from hæmorrhoids, varix in the right thigh, and a large varix of the right orbit. The last-named had given rise to a considerable and most unsightly prominence of the eye, the sight of which was reduced to No. 20 Jaeger. A congery of large worm-like veins formed a plexus towards the inner side of the globe **Sir William Collins** (London) first tied the right common carotid artery, and, then, after an interval of 14 days, enucleated the eye and removed the plexus of veins which he found to lie in the orbit. Bleeding was slight; healing was uninterrupted. The mass proved to be a cavernous angioma, and contained a few phleboliths. No recurrence in three years. Sydney Stephenson.

(22) **Nance** refers to the pioneer worker, Sir Victor Horsley, as well as to others. Dealing surgically with a case of choked disc (papilledema, Parsons) two perplexing questions demand careful consideration (*a*) location of the tumour, (*b*) the time when operative interference is to be advised. Frasier is quoted as authority for the assertion that only 4 per cent. of tumours of the brain can be localised and removed; but operation to relieve pressure is followed by subsidence of the papilledema, with improvement or retention of vision for a period at least. Early operation is advised to obtain the most satisfactory result. Conclusions:—(1) Operative procedures for the relief of papilledema in suitable cases offer a far better prognosis than treatment by drugs. (2) Free opening of the skull and dura in cases where the tumour cannot be localised is the operation of choice. (3) The operation, to be of benefit, must be performed early, before secondary and permanent changes occur in the nerve and other ocular structures. The time when vision begins to fail may be tentatively adopted as the time to operate. (4) Operative measures involving the opening of the skull and dura in papilledema dependant on anæmia, toxæmia, albuminuria, sinus disease, etc., are contra-indicated; hence the necessity of thorough examination of the blood, urine, and an investigation of neighbouring cavities before advising such radical procedures. (5) In cases of tumours implicating the basal visual tracts, decompression cannot prevent loss of sight. Henry L. G. Leask.

(23) After a review of the methods employed by different operators to induce reattachment of a separated retina, **Ellis** gives an account of two cases in which he obtained a perfect result. In both the detachment was considerable (+ 6 D. and + 7 D.), but there was no degeneration of the

retina. In one case success was obtained after the fourth scleral puncture, combined with subcutaneous injections of pilocarpine and subconjunctival injections of salt solution. The treatment was spread over some six months. Vision improved from fingers at 5 feet to $\frac{20}{40}$. After each puncture, the fields became normal, but contracted again in 1 to 4 weeks until after the 4th puncture, when they became, and have remained, normal. Success followed the second scleral puncture in the second case, combined with subcutaneous injection of pilocarpine and subconjunctival injections of dionine. Treatment occupied four months with intervals. Vision improved from (?) $\frac{10}{200}$ to $\frac{20}{30}$. The fields became normal, and no sign of separation has been since observed.

ROSA FORD.

(24) Notes of 26 cases are given, in which extraordinary pressure and indentation of the eyeball had to be employed before the cataract appeared in the wound made for its extraction. **Fernandez** ascribes this scleral collapse to the frequent use of strong solutions of cocaine. He has seen no case since he adopted a uniform instillation of 3, or at the most 4, drops of a 3 per cent. solution. ROSA FORD.

(25) **Bourgeois** (Rheims) has successfully employed the flap of skin removed from a healthy patient, aged 42 years (in A. Terson's operation for ectropion), as a graft to supply the defect left by removal of an epithelioma of the lower lid in another patient aged 59 years. J. JAMESON EVANS.

(26) **Yvert** (Dijon) discusses the relative advantages of the three usual methods for exploring the orbit, *viz.*: (a) Knapp's operation, (b) Krönlein's operation, and (c) curvilinear orbitotomy of Rollet. Knapp's operation is condemned because the cone of muscles is opened up with consequent damage to vessels and nerves, and often with serious interference with the nutrition of the eye. In the 25 cases on record, nine eyes had to be enucleated, and atrophy of the globe supervened in five other cases. Krönlein's operation has the advantage of allowing a good view of the interior of the orbit, but is apt to be followed by untoward complications. In 35 recorded cases (in 1907) normal mobility of the globe was retained in three cases only and vision only in two cases. Rollet's operation* has not so far been followed by either corneal ulceration, atrophy of the globe, or muscular paralysis, and except in cases where the optic nerve was primarily injured or intentionally divided, the vision has been retained. The position of the curvilinear cutaneous incision along the orbital margins can be varied so as to give the best access to the growth, foreign body, or cyst, and when that object is in the orbital wall, it is not necessary (or desirable) to open the periosteal cone detached from the orbital boundaries. Yvert considers this method most suitable in cases of deep orbital cellulitis or abscess, and Rollet recommends it for exploration of the periorbital sinuses.

Yvert performed orbitotomy for the removal of a bullet lodged in the apex of the orbit of a lady who had been shot by her husband about two months previously. The clinical symptoms in the case were.—A sero-purulent fistula at the junction of the outer and middle third of the left eyebrow and extending along the track of the bullet to the apex of the orbit. The left upper lid was swollen, œdematous, and in a state of absolute ptosis. The eye was normal in appearance, but was turned downwards owing to paralysis of the superior rectus. There was complete loss of the vision on the left side. Ophthalmoscopically, multiple ruptures and ecchymosis of the choroid, with fibrinous vitreous opacities and detachment of the retina, were noted. The disc was atrophic, the retinal arteries were very thin and the veins obliterated here and there and dilated in places. There were no symptoms suggestive of

* *Vide* THE OPHTHALMOSCOPE, Vol. VI, 1908, p. 105.

embolism of the central artery, and Yvert diagnosed rupture of the optic nerve at a point behind the entrance of the retinal vessels. The bullet was found imbedded in the optic nerve and the aponeurotic ring of the recti just in front of the optic foramen and was successfully removed. The fistulous track was disinfected and the patient made an uninterrupted recovery, although the muscular paralysis and loss of vision remained. Yvert decided to operate in this case because the septic foreign body formed a focus of infection which was a constant menace to the meninges, brain, orbital and periorbital strictures. In a general way, he is of opinion that foreign bodies which give rise to no local or general symptoms, and especially when situated in the deeper parts of the orbit, should be left severely alone.

J. JAMESON EVANS.

(27) **Capt. Nesfield** found that in attempting Smith's operation he was unable to expel the lens in nine cases out of ten. He was afraid to use the amount of pressure required. Latterly, he has divided the suspensory ligament below the lens and at the sides by a cystitome before expressing the lens, and the results have been excellent. No details are given, however, and no reference is made to the work of Gradenigo and others

H. HERBERT.

XIX.—MISCELLANEOUS.

(1) **Oppenheimer, E. H.—On the musical education of the blind. (Zur Musikalen Erziehung der Blinden.)** *Wochenschrift für Therapie und Hygiene des Auges*, 1 März, 1906.

(2) **Pick.—On the effect of wind on the eyes. (Zur Wirkung des Windes auf die Augen.)** *Centralb. f. prak. Augenheilk.*, Juni, 1906.

(3) **Bettremieux.—Two cases of blepharo-conjunctivitis due to the use of hair dye. (Deux cas de blépharo-conjonctivite dus à l'usage de teinture capillaire.)** *L'Ophtalmologie Provinciale*, juillet, 1906.

(4) **d'Halluin.—Contribution to the study of the signs of death. (Contribution à l'étude des signes de la mort.)** *Bulletin Général de Thérapeutique*, 23 décembre, 1906.

(5) **Dunn, Percy.—The solecisms of ophthalmic terminology.** *Lancet*, June 27th, 1908.

(6) **Béal, Raymond.—Spontaneous bursting of a double-walled artificial eye. (Eclatement spontané d'un œil artificiel à double paroi.)** *Ann. d'Oculistique*, T. CXXXVIII, p. 413, décembre, 1908.

(7) **Rollet, É.—The eye and the revolver. (L'œil et le révolver.)** *Revue Générale d'Ophtalmologie*, 31 janvier, 1909.

(8) **Dean, L. W.—Venereal diseases and blindness.** *Journal Ophthalmology and Oto-Laryngology*, January, 1909, quoting from *Iowa Medical Journal*, December, 1908.

(9) **Richards, William Martin. — A certain method of preventing common errors of the optician.** *American Journal of Ophthalmology*, March, 1909.

(10) **Davis, A. Edward.**—Post-Graduate medical instruction in Vienna. *Journal of Ophthalmology and Oto-Laryngology*, Vol. III, No. 4, April, 1909.

(11) **Keegan, D. F.**—The charitable dispensaries in the Punjab. *Lancet*, May 1st, 1909.

(12) **Beauvois.**—Trachoma and emigration. (Le trachome et l'emigration.) *Recueil d'Ophtalmologie*, mai, 1909.

(13) **Hamburger, C.**—On the artificial staining of human eyes during life for diagnostic and physiological purposes. (Ueber des Färben lebender in Euschlieber Augen zu diagnostischen und zu physiologischen Zwecken.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1909.

(14) **Skrainka, Philip.**—Louis Braille and the intellectual achievements of the blind. *American Journal of Ophthalmology*, May, 1909.

(15) **Eloui, Pacha.**—Flies and ophthalmia in Egypt. (Les mouches et les ophtalmies en Egypte.) *Revue Générale d'Ophtalmologie*, 31 mai, 1909.

(16) **Eloui, Pacha.**—A word as to the prevention of blindness and amelioration of the condition of the blind in Egypt. (Un mot sur la prévention de la cécité et l'amélioration du sort des aveugles en Egypte.) *Revue Générale d'Ophtalmologie*, 30 juin, 1909.

(1) **Oppenheimer** (Berlin) gives a brief description of an invention by Miss Hartshorn, of New York State, for the musical education of the blind by the sense of touch. ERNEST THOMSON.

(2) **Pick** relates what happened to himself.—He took a long ride on a steamer while a strong wind was blowing. After about two hours he suddenly noticed a black speck in the upper part of the field. This afterwards was found to be a small hæmorrhage in the vitreous of the right eye. Never before or since (2 years) has he had hæmorrhage in his eyes, and he ascribes it to the effect of the wind on eyes which were not quite normal (myopia of 5.5D.). A. LEVY.

(3) **Bettremieux** (Roubaix) records two cases of blepharo-conjunctivitis of an eczematous type, caused by the use of hair dyes, which probably contained aniline derivatives. R. J. COULTER.

(4) In this article **d'Halluin** is quoted as having used dionin and sulphuric ether (on different occasions) as drugs which, by provoking reddening of the eye while the circulation continues, may be used to ascertain whether or not cardiac movements have ceased. ERNEST THOMSON.

(5) In a letter to the Editor of the *Lancet* **Dunn** (London) denounces old-fashioned ophthalmic terms "sanctified by use," such as "ophthalmia neonatorum," because it is Græco-Latin, "sympathetic ophthalmia" because it implies an obsolete theory, "lenticular" because it should be "lental," and "crystalline lens" because the lens is not crystalline. He objects to "phthisis bulbi," because phthisis has come to mean pulmonary consumption. No doubt, it is all very true, but terms sanctioned by use die hard. ERNEST THOMSON.

(6) **Béal** records a case in which one of Snellen's improved artificial eyes burst in the socket of the wearer with a report like that of a revolver. The accident wounded the conjunctiva, causing severe pain. On removing the eye, a hole was found in its posterior wall, the broken fragments being inside the shell. The author quotes a similar case recorded by Millikin. As he has

found on enquiry that there is a more or less perfect vacuum in the interior of such eyes, he considers that the accident cannot have been caused by expansion of their contents, and must have been due to atmospheric pressure acting on the weakest part of the wall of the eye. To avoid such occurrences in future, he suggests that the weak point should be strengthened, or that a hole should be bored in the eye to do away with the vacuum. The reviewer has met with a similar case. R. J. COULTER.

(7) **Rollet** (Lyons) reports six cases of revolver wounds, five of them suicidal, with the wound of entrance at the right temple, and one accidental, with the wound at the upper-inner angle of the orbit. *Case* 1.—Large direct wound of the posterior segment of right eye; bullet applied (*plaquée*) to the right inner orbital wall. Enucleation and orbito-temporal drainage. *Case* 2.—Contusion of right eye with detachment of retina by blood; bullet came out through the eyelid. Enucleation for late irido-cyclitis. *Case* 3.—Fracture of three orbital walls by the bullet passing through both orbits, and being stopped by the outer wall of left orbit. Blindness on right side from intra-ocular hæmorrhage and phthisis; amblyopia on left side from contusion, with retinal hæmorrhages. *Case* 4.—Fracture of three orbital walls, bullet stopped at the left inner orbital wall. Right-sided blindness from division of the optic nerve (retinal œdema, papillary and retinal hæmorrhages). Left eye intact. *Case* 5.—Old wound at the temple. Progressive right phthisis bulbi. Enucleation three years after the accident. *Case* 6.—Bullet wound at supero-internal angle of orbit. Radiograms showed bullet stopped at the inner wall of the orbit. Unsuccessful attempt at extraction. Papillitis, retinal hæmorrhages and commotio retinæ.

With a wound of the right temple and evident lesion of the right eye, one must make sure as to possible lesion of the left eye by taking localising radiograms. Only the large perforating wound of the globe calls for immediate enucleation and a rapid search for the bullet. Violent contusions generally mean enucleation later on. Systematic search for the bullet is seldom indicated, it is particularly difficult in the region of the inner orbital walls, and, as a matter of fact, the bullet may be tolerated perfectly well.

ERNEST THOMSON.

(8) As a result of the examination of 157 children in attendance at the College for the Blind. Blindness in 26, or 16 per cent., was found to be due to blennorrhœa neonatorum, 25, or about 16 per cent., due to heriditary syphilis, showing that among children, syphilis and gonorrhœa are about equal in their causative relation to blindness. The number of cases of gonorrhœal origin is decreasing, and this is ascribed by **Dean** to the more general adoption of prophylactic measures on the part of obstetricians. HENRY L. G. LEASK.

(9) The essence of **Richards'** article is that, whenever possible, the optician's product should be most carefully checked by the oculist, using modern apparatus. "Simply neutralizing (the lenses) or using a lens measure and test card is not sufficient. It is necessary that the axis be tested on an axis finding and centreing machine, with a revolving dial, in order for small differences to be noted, and without the possession of such an apparatus oculists have no adequate protection against careless opticians. Within a month I have carefully tested the glasses ground for my patients by six of the leading opticians of New York City, and, in four cases out of five, they were wrong in the axis, the error varying from two to twelve degrees . . . . . Unfortunately at the present time, very few oculists own the necessary apparatus for this purpose."

To the reviewer it occurs that while the optician obviously wishes to become the oculist, the oculist will soon be compelled to become an optician!

ERNEST THOMSON.

(10) **Davis** gives as his reasons for preferring Vienna to Berlin the short course and the fact that instruction is given in English.

He was favourably impressed by Meller's operation for the removal of the lacrymal sac under cocaine anæsthesia. The "sac is pulled out of its connective tissue surrounding with the loss of but little blood, without much pain and practically no scar."

Private courses may be arranged, as desired, for the individual student for as long or short a time as preferred.

The generous endowment of the hospitals relieves the teachers of financial worry, and they can prosecute the scientific aspect of this subject untrammelled by the claims of a private practice.

The enthusiasm of the teachers is remarkable. It is only a question of time—and endowment—when the American post-graduate schools will equal, excel, and draw students from abroad—"certainly we will hold in check the tide which has flowed in that direction too many years already."

The American Medical Association in Vienna is mentioned with commendation. HENRY L. G. LEASK.

(11) **Lieut.-Colonel Keegan, I.M.S.,** draws attention to the triennial report on the above subject by Colonel Bate. There are some points of interest to ophthalmic surgeons, chief among them being the opportunities which service in India offers for rapidly acquiring manual dexterity. Cataract operations amounted to 23,270, and the percentage of good vision was 93.42. It is stated that the high percentage of good vision is accounted for, to some extent, by the fact that Major Smith in performing about 8,000 of the extractions has a percentage of good vision over 99. As to Smith's operative procedure, it is said "there is no getting away from the fact that extracting cataract in the capsule is the ideal operation if a surgeon can do it well. It is the operation which has been the dream of all enthusiastic ophthalmic surgeons the world over, but a dream so seldom realized. It has been reserved for India to realize this dream . . . and there can be little doubt that in a few years the number of surgeons in the Indian Medical Service who will perform extractions in the capsule as the operation of election will rapidly increase. For immature cataracts extraction in the capsule is the operation *par excellence* . . . When extraction in the capsule becomes a popular operation among ophthalmic surgeons in India a great boon will be conferred on natives of the country who are now obliged to waste long periods of time whilst waiting for their cataracts to ripen." ERNEST THOMSON.

(12) **Beauvois** draws attention to the strict laws of the United States and Canada with regard to the admission of trachomatous immigrants, and the consequent scrutiny of emigrants by the shipping companies at the ports of embarkation. Many of the rejected emigrants get stranded, for variable periods of time, in France, and constitute the majority of trachomatous cases attending at the hospital clinics of Paris.

These rejected emigrants are mostly of Jewish origin, and come from Russia, Palestine, Roumania, Syria, and Italy. During their sojourn in Paris they lodge for economical and other reasons with their compatriots or co-religionists in the old, overcrowded, and narrow streets of wards iii. and iv. It is interesting to note that, notwithstanding their poverty and unfavourable surroundings, the disease remains confined to the emigrants, and is not to any extent transmitted to the native Parisians in the same part of the town. Dr. Page, of Quebec, has also found that trachoma is not to any appreciable extent communicated to Canadians nor to settlers from north-west Europe. Trachoma affects patients of all ages and both sexes. Beauvois has seen a baby of one year old attacked by the disease. Corneal complications were comparatively

rare (30-35 out of 483 cases), probably because the average emigrant is young. In Canada keratitis from trichiasis and entropion is almost unknown. In discussing the ætiology of trachoma, Beauvois is convinced that, apart from defective hygienic conditions, poverty, and malnutrition, there is a definite race proclivity. That the disease does not spread among western Europeans and Americans is due to race immunity and possibly to climatic conditions.

In England, however, we do not find the distribution of trachoma so sharply defined as it appears to be in Paris, and most British ophthalmic surgeons would be glad to see the Aliens' Immigration Acts more rigidly applied in the direction of exclusion of diseased aliens. J. JAMESON EVANS.

(13) The dye uranin introduced into physiology by Ehrlich in 1882 has been applied by **Hamburger** to clinical purposes. It is non-poisonous, and given internally in solution causes a yellow discolouration of the skin and mucous membranes. A luminous green colour is imparted to the aqueous humour of deeply inflamed or injured eyes, whereas that of healthy or only superficially inflamed eyes remains unstained. The phenomenon is observed within 30 to 90 minutes in cases of severe inflammation ; it is delayed in those of a milder character, according to the gravity of the affection. Observations with the same colouring matter have, moreover, convinced Hamburger of the important share the iris takes in the regeneration of the aqueous humour, a view totally opposed to that of Leber. C. MARKUS.

(15) In this two-page article **Eloui** points out that Morax, in his article on conjunctival diseases in *Encyclopédie française d'Ophtalmologie*, has omitted to mention that ophthalmias in general and "conjunctival granulations" in particular may be spread through the influence of flies in a dusty country, where the people are of dirty habits. Eloui considers the omission of sufficient importance from the point of view of prophylaxis to warrant his drawing attention to it. ERNEST THOMSON.

BOOK NOTICES.

Le Kératocone. (Keratoconus.) By Professor PARISOTTI, of Rome. Rapport présenté le 3 mai, 1909. Paris : G. Steinheil, éditeur, 2, Rue Casimir-Delavigne, 1909.

Professor Parisotti's monograph, which extends to 142 pages, was presented in May last to the French Ophthalmological Society as an introduction to a discussion on conical cornea. It constitutes a careful and complete study of a rare and curious disease, first described by the British surgeon Wardrop.

Conical cornea is regarded by Parisotti as a morbid entity, which depends essentially upon a lack of resistance in the central parts of the cornea, rendering the latter incapable of sustaining even the normal intra-ocular tension. The lack of resistance is primary, in the sense that it is neither produced nor determined by any inflammatory or ulcerative change. It is a congenital defect, as suggested by Sir John Tweedy seventeen years ago (*Transactions Ophthalmological Society U.K.*, Vol. VII, p. 67). Parisotti believes that the congenital fault is probably to be sought in the anatomical structure of the central parts of the cornea. The existance of elastic fibres in the cornea, although denied by some writers, appears to be proved by the impregnations of Tartuferi and by the staining reactions of Lieto Vollaro and Monesi, and the author suggests that these may be the elements more particularly involved

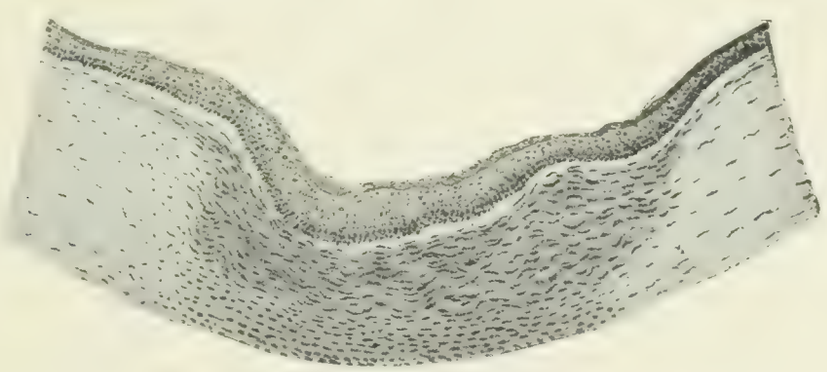
by the changes which eventually lead to the production of conical cornea. It is therefore suggested that future researches into the histology of keratoconus should bear especially upon the elastic elements of the cornea. At the same time it cannot be wholly denied that the congenital predisposition may be due to imperfect trophism, more marked towards the centre of the cornea than elsewhere. No connection can be traced between the general health, on the one hand, and the conicity of the cornea, on the other.

As regards treatment, no rule can be laid down, since the cases differ so much amongst themselves.

When the process is in an early stage, we must content ourselves with giving the patient the best optical correction for near-work and with improving distant sight, as much as may be, by stenopaic appliances. Contact lenses, as devised by Herschell, Fick, Sulzer, and Lohnstein, are not advised, since they cannot be tolerated by the patient. Myotics, and, in particular, pilocarpine, should be employed, and a compressive bandage should be worn at night. The patient should be kept under close medical supervision.

Should these measures fail, surgical treatment must be seriously considered. The results of such treatment, as Parisotti points out, are always less harmful than the course of the disease when left to itself. Operative measures may be commenced by paracentesis, peripheral sclero-corneal incisions, and especially by transfixion, as proposed by Schiess-Gemuseus. As to the operation last-named, a puncture and a counter-puncture, each 3mm. broad, are made at the base of the protrusion by means of a very narrow Graefe knife, and a second transfixion, perpendicular to the first, is practised in the course of a few days.

In more advanced cases the best operation is to burn the centre of the cone by means of the galvanic wire. Experiments made by Parisotti upon rabbits show that the tissue destroyed by the cautery is soon replaced by connective tissue of new formation, covered by several layers of epithelium.



The figure, which represents a section from a rabbit's cornea on the twenty-third day after deep cauterisation, shows very well the newly-formed connective tissue, as well as the hyperplasia of the corneal epithelium. An important point is that the contraction of the new connective tissue tends to flatten the cornea. If the cornea be perforated by the point of the cautery the result is even better, while the operation is not more liable to be followed by complications than is simple cauterisation. The good effects of perforation are explained by Parisotti in the following words:—"Cauterisation pushed as far as perforation yields a result much better than cauterisation which leaves intact some layers of the cornea. When, in effect, one leaves intact layers, a cicatrix may be obtained which may be apparently very satisfactory, but the intact layers oppose to retraction and consequently to flattening of the cornea a more or less serious obstacle" (p. 120). Under any circumstances a subsequent

optical iridectomy will probably be needed. Treatment by myotics and compression should be kept up for some time after cauterisation, or, indeed any other surgical measure, has been adopted.

Parisotti manifests a familiarity with British literature that is as praiseworthy as it is unusual in a foreign writer, more especially, perhaps, if he happen to hail from Italy or France. At the same time the spelling of familar names sometimes comes as a shock to insular minds. "Burdnell Cartes" for "Brudenell Carter," "Emery Jones" for Emrys-Jones," "Bowmann" for "Bowman," "Silcook" for "Silcock," "Cowel" for "Cowell," "Machay" for "Mackay," "Twedy" for "Tweedy," and "Wite Cooper" for "White Cooper" are among a few of the orthographical errors noted by the reviewer in the course of his reading. SYDNEY STEPHENSON.

Manuel Pratique du Strabisme. (Practical Treatise on Squint.) By Dr. RENÉ ONFRAY, of Paris. Preface by Dr. ROCHON-DUVIGNEAUD. Paris: G. Steinheil, 2, Rue Casimir-Delavigne. 1909. Price 5 francs.

Manuel Pratique du Strabisme is the title of a book recently written by Dr. René Onfray, of Paris, and in it he discusses the whole question of squint. It is divided into four parts, of which the first deals with normal binocular vision, the second, convergent squint, the third, divergent squint, and the fourth with vertical displacements. Each part is divided into several chapters. Much that is written bears a striking familiarity to other works we have read on the subject—for instance, the figures on pages 8 and 9, with the accompanying text, are taken from Worth, who, in his well-known book, "*Squint*," acknowledges that they were suggested to him by Verhoeff, of Boston, U.S.A. Here, however, the source is not acknowledged. The first part of chapter 2 is taken in a similar manner from the same author, while the second part of this chapter contains a clear and concise description of various forms of stereoscopes. Pages 71-90 are mostly rearranged ideas taken from Worth, and the same applies to other pages as well. On page 188 are two figures illustrating a method of elongating a muscle, which is here ascribed to Landolt. We were always under the impression that this method was first described by Sydney Stephenson, whose original paper was published in the twenty-second volume of the *Transactions of the Ophthalmological Society of the United Kingdom* for 1902, p. 276.*

The operation for advancement of a muscle is described on page 193 and following, and this we consider very inferior to most other operations in general use. The needles, says Onfray, are to be passed above and below the cornea through the conjunctiva and episcleral tissues. It is well-known that this tissue will not securely hold the sutures, while if a deeper hold were to be sought in the sclera at the situation shown in the figure on page 197, it would be very dangerous, as this is the thinnest part of the sclera, situated directly over the ciliary body. If, however, the sutures did hold it would be impossible to maintain exactly the same tension on both, and the result of any inequality would be an elevation or depression of the cornea, and its rotation round a fore and aft axis; the sutures would also have an extremely bad lead from a mechanical point of view by the time they were tightened and pulled forward to the corneal margin.

We are by no means impressed with the book, which chiefly contains the result of other people's work (which is by no means always acknowledged) and

*Also in the *Lancet*, Sept. 23, 1905, and *La Clinique Ophtalmologique*, October 10, 1905.

it conveys the impression of having been written as the result of the study of previously published works, rather than as the result of the clinical observations of the author. C. DEVEREUX MARSHALL.

Traumatic and Inflammatory Affections of the Orbit, and Inflammations of the Periorbital Sinuses. (Affections traumatiques et inflammatoires de l'Orbite: Sinusites periorbitaires.) By PROFESSOR ROLLET, Lyons. Paris: Octave Doin et Fils. 1909.

The two essays which compose this volume have been reprinted from the French Encyclopædia of Ophthalmology, and, as will be seen from the title, they deal with subjects to the elucidation of which Prof. Rollet has made numerous important contributions. Many of the affections dealt with belong rather to the domain of the general surgeon than to that of the ophthalmologist, but for that very reason the book deserves the careful study of the specialist, for it introduces him to aspects of ophthalmology which are apt to be omitted from the text-books. One need only quote, as an example, the interesting discussion on the latency of fractures of the orbit, caused by injuries in that neighbourhood. Several cases are quoted from Berlin, Mackenzie, and others, in which, unexpectedly, death occurred in spite of the apparent absence of anything more serious than a bruise or a trifling wound. A similar interest for the ophthalmologist attaches to the possibility of serious or fatal meningo-encephalitis arising as a complication of an orbital injury, several days after the healing of the surface wound.

Being an exhaustive and unbiassed survey, there are few points which single themselves out for critical examination, but a brief summary of the contents of the volume will serve to indicate its scope.

Under the title of traumatic and inflammatory affections, the author takes up in detail the fractures of the orbit, direct and indirect. This section is well illustrated, both by pictures and by the quotations of cases. Special attention is devoted to the mechanism of fractures of the optic canal, and to the visual trouble arising in connection with orbital fractures in general. Chapter III. deals with effusions of blood in the orbit, and under this head is discussed the differential diagnosis of ecchymosis symptomatic of fracture of the orbit, and that due to direct contusion of the orbital region. Another chapter deals with foreign bodies in the orbit.

The inflammatory affections of the orbit are considered under the headings of Tenonitis, phlegmon, thrombophlebitis, and osteoperiostitis of the orbit (including tuberculous and syphilitic affections).

The second essay is concerned with the very important subject of the inflammatory affections of the periorbital sinuses. The treatment of these is fully discussed, even to the surgical treatment of pansinusitis.

In every part of the work the author deals systematically and thoroughly with the history, pathology, ætiology, symptoms, complications, diagnosis, prognosis, and treatment of the affection under discussion.

In his lucidity of style and his apt use of illustrative cases, one is often reminded of the classical work of Mackenzie, to which we are often referred. The illustrations are good, but are confined almost entirely to the sections on orbital fractures and affections of the sinuses. Typographical errors are few, and occur chiefly in the spelling of authors' names.

The book is a pleasure to read, but it is essentially a work of reference. It is to be regretted that neither an index nor a table of contents has been provided. ARTHUR J. BALLANTYNE.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

A CASE OF RETRO-OCULAR NEURITIS.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

In reference to the case of retro-ocular neuritis described by me in the last number of THE OPHTHALMOSCOPE (page 600), I may be permitted to add that the field of vision has now become nearly normal, the scotoma has disappeared, and that the sight of the right eye is 1/10, and of the left eye 1/8.

I am, Sir,

Yours truly,

MANSOURAH, EGYPT.
August 24th, 1909.

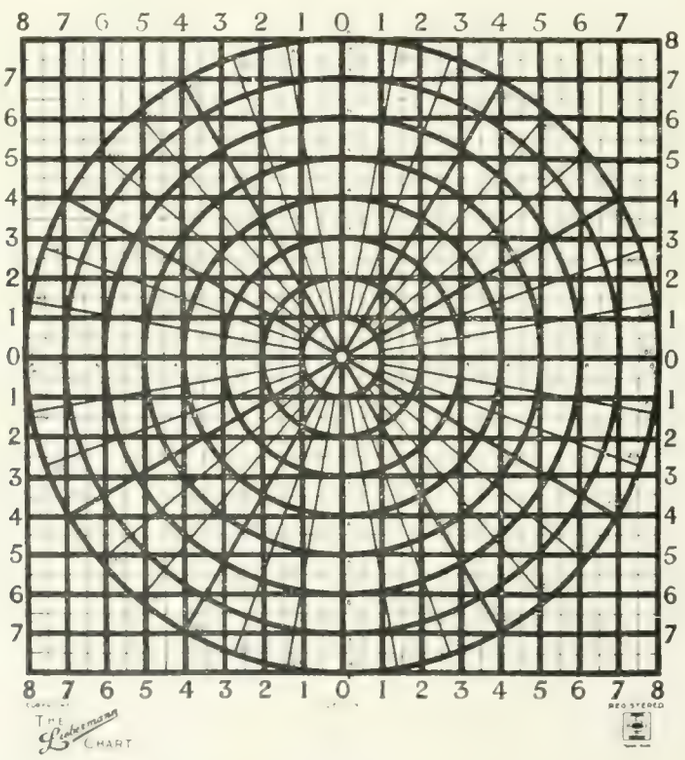
(Dr.) NASR FARID.

A SIMPLE SUBSTITUTE FOR A ROTATING PRISM.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

In regard to the muscle testing chart, described by Mr. Harold Grimsdale in your issue of July last, I must claim originality, since a similar device was



produced by me and exhibited in March, 1909, at the London Ophthalmic Exhibition, where it was inspected by a number of ophthalmic surgeons. Since my invention is protected, it is a question whether such a copy as is published in THE OPHTHALMOSCOPE does not constitute an infringement of my patent rights. Apart from that question, I, who know the utility of the chart, beg to thank Mr. Harold Grimsdale for the able exposition he has given of the device, especially because muscle testing is now being carried out to a greater extent than was ever before the case.

I may say that I bring this matter forward merely to substantiate my claim of having been the first to introduce the test.

I am, Sir,
Yours faithfully,
LEONARD L. LIEBERMANN.

16, Upper Brook Street, Manchester. (Manufacturing Optician).

To the Editor of The Ophthalmoscope.

Sir,

From Mr. Liebermann's pamphlet ("Muscle Testing: The New Chart") I see that there is a considerable superficial likeness between his chart and mine described in The Ophthalmoscope of July, 1909. But, so far as I can make out, his chart and apparatus are intended to be used as a direct test, and therefore, he says, "there is no calculation whatever." On the contrary, mine is meant to simplify calculation by showing graphically the varying values of the sines of the angle between 0° and 90°. It is not intended, nor could it possibly be used, as a direct test, but is, as I pointed out, a cheap and simple method to enable one to use any prism as a substitute for a special rotating prism. It is some years since I made revolving prisms graduated by the sine of the angle, and this is merely the graphic representation thereof. I observe that the circles on Liebermann's chart are not graduated. This is a very important point in mine.

In the second part of my note (last paragraph) there is shown a means of calculation very similar to that in Mr. Liebermann's chart; but here again, in this secondary and unimportant point, it is not used as a direct test but as a simplification of calculation.

I am, Sir,
Yours, etc.,
HAROLD GRIMSDALE.

3, Harley Place, London, W.

THE DIPLOSCOPE.

To the Editor of The Ophthalmoscope.

Sir,

Having been invited by the President of the Oxford Congress, Mr. R. W. Doyne, on a recent occasion to demonstrate my diploscope, I did my best to attain this result. Unfortunately, an account of my instrument and a review of my papers, published by Mr. N. Bishop Harman in the *Ophthalmic Review*, of January, 1909, has given such a false idea that I think it now advisable, not only to indicate omissions and faults, but also to demonstrate how carelessly this article was written.

The article in question said; "The principle of the Diploscope is that of the well-known bar-reading test of Javal." There is a bar in the diploscope; but this bar is not the same as in the bar-reading test. It is not of great importance; it is rather an accessory. In many experiments it must be completely removed. On the contrary, I have explained that the real principle of the diploscope is the phenomenon of physiological diplopia (See the *Diplogramme*). "La conception du Diploscope de Rémy repose sur le phénomène de la diplopie physiologique." (Rapport sur le Diploscope de Rémy de Dijon, lu à l'Académie de Médecine, 30 septembre, 1906.)

In the *Ophthalmic Review*, of April, 1909, Mr. N. Bishop Harman describes an instrument exactly the same as a part of the diploscope smaller model, which he calls the "Diaphragm Test," and he begins by saying "this test is the reverse of Javal's well-known bar-reading test." How does it happen that

now the principle of the diploscope is that of the bar-reading test of Javal, and now is the reverse of Javal's bar-reading test?

In the diploscope there are three tests: 1, four letters; 2, three letters; 3. two letters. The three letters test is clearly indicated in several places as the real test of binocular vision. (*e.g.*, Communication faite au Congrès de Heidelberg, août, 1908.) C'est elle (l'experiénce à 3 lettres et non celle à 4 lettres) qui doit servir de *véritable test de vision binoculaire*. Three letters test must be employed as the real test of binocular vision.

In addition, there is a large diplogramme for the experiment with three letters, with coloured letters (French edition), with Gothic and Roman letters (German edition).

In THE OPHTHALMOSCOPE, October, 1908, Mr. J. Jameson Evans writes, "This (three letters test) is a good test of binocular vision."

I am surprised that with such clear indications Mr. N. Bishop Harman has omitted my *three letters test*, and has written "that, says Rémy (KOLA, four letters test), is the best test for binocular vision."

I never said so. On the contrary, read my first pamphlet, page 9, "the sixteenth experiment (*three* letters) is conclusive, for it unites better all the conditions of the veritable binocular vision."

Page 10. The diploscope admits of a second test.

Page 11. *Second dispositif.* Two holes are only 33 millimetres apart.

Page 14. A three letters experiment.....is interesting in that it more nearly approaches the conditions of binocular vision.

Page 23. D Œ A.

Page 32. After having indicated *the defects of the four letters experiment*, I write: In order to avoid the defect of the instrument in the first experiment (four letters), I performed the second test, thanks to which I avoided that seeming discrepancy, placing myself quite within the normal and ordinary conditions of binocular vision.

In all that, I indicate the superiority of the three letters test; I find fault with the four letters test, and Mr. N. Bishop Harman has not seen that!!

In January, 1909, Mr. N. Bishop Harman criticises the four letters test, but does not mention the good test. In April, 1909, he copied the good test, and praises the same results which I had already indicated.

At Oxford I indicated the means by which the malingerer could circumvent this too simple test. Several years ago I had already known this and therefore I constructed a more complex diploscope with eight holes.

In the cure of a squint all the tests of the diploscope are useful, especially the two letters for the cure of suppression and vertical squints. The three letters test alone is not sufficient. It is the same with that which Mr. N. Bishop Harman calls his test.

I am, Sir, yours faithfully,

(Dr.) A. RÉMY.

Dijon,
France,
August, 1909.

NOTES AND ECHOES.

Deaths.

OPHTHALMOLOGY, no less than general medicine and dermatology, has to deplore the death of Sir Stephen Mackenzie, which took place, after much suffering, at Dorking, Surrey, on September 3rd. Born in 1844, Mackenzie was the son of a medical practitioner at Leytonstone, thereby adding one more to the many examples of a medical father giving to his chosen profession an even more distinguished medical son. This becomes all the more striking in the present case when it is remembered that the late Sir Morrell Mackenzie, the

famous throat specialist, and Sir Stephen Mackenzie were brothers. Stephen was educated at Christ's Hospital, the "Blue-Coat" School, then in the City of London. His medical education was received at the London Hospital and the University of Aberdeen, where he graduated M.B. in the year 1873. In the following year he was admitted a Member of the Royal College of Physicians of London, and was elected a Fellow in 1879. Meanwhile, Mackenzie had been appointed assistant physician to the London Hospital, with charge of the Skin Department. At a later period he was appointed lecturer on medicine and pathology at the London Hospital Medical College. Mackenzie was an original member of the Ophthalmological Society of the United Kingdom, of which he was the first honorary secretary. Several important communications from his pen will be found in the earlier volumes of the Society's *Transactions* dealing with such quasi-ophthalmological subjects as hemianopia, pernicious anæmia and retinal hæmorrhage, tubercle of choroid, and retinal hæmorrhages in acute vascular disease. For many years Mackenzie occupied the post of physician to the Moorfields Hospital, in which he was succeeded by Dr. James Taylor. Mackenzie was created knight in the year 1903. R.I.P.

The deaths are also announced of M. H. Garten, of Lincoln, Nebraska; of Grant Cullimore, of Oklahoma; of John H. Rule, of Middleton, Pa.; and of William I. Edwards, of Nashville, Tenn.

* * * *

Appointments.

S. RISELEY has been appointed honorary ophthalmic surgeon to the Sheffield Institution for the Blind, in succession to the late Simeon Snell. Charles H. Francis has been appointed assistant professor of ophthalmology at the Chicago Polyclinic. Dr. Bruno Fleischer has been granted the title of professor of ophthalmology in the University of Tubingen. A. Bietta, has been nominated extraordinary professor of ophthalmology in the University of Siena. Major R. H. Elliot, I.M.S., has consented to act as correspondent of THE OPHTHALMOSCOPE (conjointly with Colonel H. Herbert) for the East Indies. Miles Standish has been appointed Williams professor of ophthalmology in Harvard University. J. N. Roy, of Montreal, a communication from whose pen will be found in the present number of THE OPHTHALMOSCOPE, has had the order of the *Dragon de l'Annam* bestowed upon him by the French Government. Dr. Motais, of Angers, has received the decoration of the *Legion d'Honneur*.

* * * *

The Duke Charles Theodore, M.D.

THE following from a recent issue of the *Pall Mall Gazette* is not devoid of interest:—"One of the few Royal medicine men is having his seventieth anniversary royally celebrated in Bavaria. Duke Charles Theodore, M.D., is not only a popular Prince, but a more than popular practitioner. His mission in life declared itself somewhat late. He was eight-and-thirty when he entered the Munich faculty as a student; and there were those who laughed and chaffed at the notion of this mature student really meaning business. Duke Charles Theodore, however, not only meant business, but got it. He was soon in the enjoyment of a large practice at Tegernsee, and only retired from it when he specialised as an oculist, and started a 'Klinik' in the Bavarian capital. Now his name and fame are great throughout the Fatherland. When the Kaiser met with that unfortunate accident aboard his yacht in northern waters, and the return end of a rope inflicted a dangerous back-hander on the Imperial eye, it was at the desire of the Kaiserin that Duke Charles Theodore was called in, and it was he whose treatment restored the injured optic. Naturally, the Duke has ever since been regarded with a favourable view in high quarters, and, naturally also, his practice has increased, until now the Munich 'Klinik' hardly suffices for its daily crowd of patients."

Sir John Tweedy.

THE introductory address at the opening of the winter session of University College Hospital Medical School, London, will be given on October 1st by Sir John Tweedy, consulting ophthalmic surgeon to the Hospital.

* * * *

Eyesight in the Royal Navy.

WE understand that for the future the medical examination of men in the Navy for draft will include tests of vision. It is even more significant to note that sight will be tested periodically, so that in action the crew may be posted to the best advantage.

* * * *

Connecticut and Optometry.

THE State of Connecticut has maintained its reputation for sound sense once again by rejecting the Optometry Bill that has been before the legislature for several months. The Bill was rejected without a dissentient vote. It may also be noted that the Missouri Legislature has refused to consider the Optometry Bill after hearing evidence by physicians and others interested.

* * * *

British Ophthalmic Hospital, Jerusalem.

WE notice that an assistant surgeon is required to that famous institution, the British Ophthalmic Hospital at Jerusalem. The honorarium is £300 per annum.

* * * *

The Mercantile Marine.

IN the sight tests for officers of the mercantile marine a higher standard is to be enforced after January 1, 1914, and candidates will be required to possess full normal vision in one eye, and at least half normal vision in the other.

* * * *

Colour Vision in the Mercantile Marine.

IN the *Lancet* for June 19, 1909, Mr. Devereux Marshall has a strong letter of condemnation of the methods of the Board of Trade with regard to the examination of candidates for various certificates. He relates a glaring case of official incapacity in testing colour vision. In this case the candidate was passed for his second mate's certificate, but was rejected when he came up for examination as "mate." He applied for a special examination and was again rejected. Next, the candidate went to an ophthalmic surgeon, who found he had good colour vision, and reported so. Even now the Board of Trade did not take expert opinion, but appointed a special tribunal (consisting of the president of the local Marine Board, a magistrate, a member of Parliament, and one or two ship's captains) to decide between the doctor and the lay examiners. By this Board the certificate was granted. In the *Lancet* for June 26, 1909, Mr. A. A. Bradburne confirmed Mr. Marshall's experience, only in the opposite sense, for a hypermetrope of nine dioptics, aged 26, had for several years acted as look-out on big Atlantic liners. He complained that it was almost impossible for him after being some time on watch to discover anything distinctly at any distance beyond a ship or two's length away, and at night he was almost blind as far as look-out work went.

* * * *

Trachoma Prize.

THE Prize of 1,000 crowns offered by the Hungarian Minister of the Interior for the best work on Trachoma, which was to have been given at the International Congress of Medicine at Budapest last month, has been withheld. In the opinion of the jury, none of the essays sent in, seven in number, indicated any remarkable progress. Under the somewhat peculiar circumstances of the case, this appears to be the simplest way out of a difficulty. *Verb. sap.*

* * * *

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. VII.—No. 11.] *NOVEMBER 1, 1909.* [TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

ON THE OCCURRENCE OF MISPLACED DERIVATIVES OF THE SECONDARY OPTIC VESICLE IN CONGENITALLY ABNORMAL EYES.

BY

GEORGE COATS, F.R.C.S.

CURATOR ROYAL LONDON OPHTHALMIC HOSPITAL, E.C.

IN the course of some recent studies of congenitally abnormal eyes, I have been much struck with the frequent occurrence of certain derivatives of the secondary optic vesicle in situations where other derivatives ought normally to be found. The abnormal position of the structures is not due to any process of folding or dragging after their formation, but to a true metaplastic development *in situ*—the condition is one of misplacement, not displacement. The explanation of these appearances seems to involve a principle of wide applicability, which has received little consideration from writers on congenital abnormalities, or has, at most, been used to explain individual cases (Haab, Monthus and Opin, Hess).

The hypothesis which I wish to elaborate and illustrate in the present paper may be stated as follows.—In the normal development of the eye the outer layer of the secondary optic vesicle forms the pigment epithelium of the choroid and ciliary body, and the anterior of the two pigmented layers of the iris; the inner forms the retina and its anterior continuations, *viz.*, the unpigmented epithelium of the ciliary body and the posterior pigmented layer of the iris. In the developing optic nerve both layers are present as far back as invagination extends, that is, to the point of entrance of the central vessels, but both form the same thing—probably the ultimate neuroglial framework among the nerve fibres; without having been invaginated the same cells have the same destiny further up the nerve.

In the normal fully developed eye the boundaries are perfectly sharp, not only between the two layers of the optic vesicle, but between the different portions of the same layer. Thus, the pigment epithelium is sharply delimited from the retina at the edge of the nerve entrance, and there is no transitional stage between these two and the neuroglial framework of the nerve; similarly, at the ora serrata the retina passes abruptly into unpigmented epithelium, and at the root of the iris the unpigmented epithelium becomes pigmented.

It would seem, however, that in congenitally abnormal eyes these boundaries are not always so precisely fixed; in other words, that one layer of the optic vesicle may develop into structures which are normally only formed from the other, or that from a given portion of one of the layers tissues may develop which should only originate from some other portion of the same layer. It should be remembered that both layers of the vesicle are originally derived from the single undifferentiated layer of epiblast which lines the neural canal, and it is quite unknown under what influences, and at what date, the cells acquire the potentialities which direct their development into one tissue or another.

The derivatives of the optic vesicle are four in number, (1) pigment epithelium, (2) unpigmented epithelium, (3) retina, (4) neuroglia; and these might occur in four situations, (1) on the iris, (2) on the ciliary body, (3) on

the choroid, and (4) in the optic nerve. The combinations, normal or abnormal, which might be found are, therefore, as follows :—

I. On the iris — (1. the anterior, 2. the posterior, or 3. both) — lining layers might consist of — (a. pigment epithelium. b. unpigmented epithelium. c. retina. d. neuroglia.)

II. On the ciliary body — (1. the external, 2. the internal, or 3. both) — lining layers might consist of — (a. pigment epithelium. b. unpigmented epithelium. c. retina. d. neuroglia.)

III. On the choroid — (1. the external, 2. the internal, or 3. both) — lining layers might consist of — (a. pigment epithelium. b. unpigmented epithelium. c. retina. d. neuroglia.)

IV. In the nerve there might be found — (a. pigment epithelium. b. unpigmented epithelium. c. retina. d. neuroglia.)

I have set out this schema in full because I wish to make subsequent use of the numbering here given. Of the conditions mentioned the following are normal and need not be further discussed :— I, 1, a, (*i.e.*, on the iris, anterior layer pigmented) ; I, 2, a ; I, 3, a ; II, 1, a ; II, 2, b ; III, 1, a ; III, 2, c ; IV. d. Taking the other possibilities *seriatim* I hope to show that a considerable number of them can be actually demonstrated.

I.

The abnormalities included in this section need not be analysed separately, since none of them, so far as I know, has been observed—there is no record of one or other of the epithelial layers being replaced by an unpigmented epithelium,* by retina, or by neuroglia. In view of what is said below about tumours of the ciliary body, it may be mentioned that Hirschberg and Birnbacher have described an unpigmented epithelial tumour growing from the back of the iris. The case is quite unique, and its classification and significance are doubtful, but Fuchs, who had an opportunity of comparing sections of it with the ciliary body tumours to be mentioned presently, believed that it was of a similar nature. It occurred in a man, aged 26, which is against a congenital origin, and it was associated with iridocyclitis and glaucoma.

II.

In the ciliary body both epithelial layers may be pigmented (II, 2, a ; II, 3, a)

Fig. 1 shows an example of this condition. It is derived from a case of microphthalmos in which a large strand of mesoblast ran from the retina

* It need scarcely be pointed out that ordinary albinism has no connection with the cases here discussed.

through the vitreous to the ciliary body. The shrunken lens was anchored to this mesoblast and dislocated downwards; in its displacement it had carried with it a sheet consisting of part of the inner layer of the epithelium of the ciliary body. This sheet had been distended into a pouch by the collection

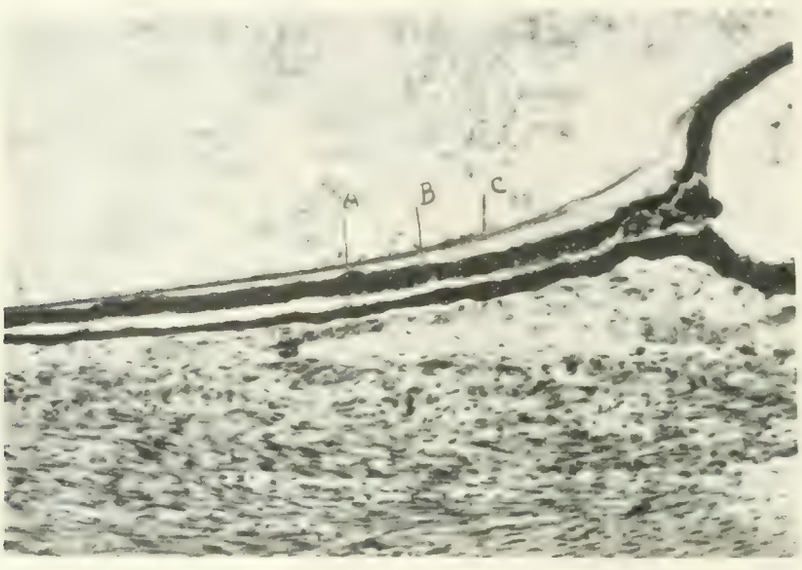

Fig. 1. Pigmentation of the inner layer of the ciliary epithelium. A. Outer layer. B. Inner layer. C. Zonula. The ciliary muscle is seen below.

of aqueous in the posterior chamber, owing to malformations of the iris and pupillary membrane. The child was born at term, and showed many other abnormalities—polydactyly, absence of the premaxilla, etc.

The figure shows a part of the ciliary body in which the inner, as well as the outer, layer of the epithelium is pigmented. It might be supposed that this is merely a portion of the posterior layer of the iris epithelium pulled back by the distension of the pouch, or prevented from growing forward by the insertion of the mesoblastic mass in front; but this is not the case, for the same condition was also present on the opposite side, where the iris was fairly well-formed. Moreover, a well-developed zonula (*c*) will be seen in the figure, showing that the cells are not displaced, but are really the epithelial layer proper to the ciliary body.

In the ciliary body a portion of the unpigmented layer may be replaced by structures resembling embryonic retina (II, 1, c.)

There is no record of fully developed retina in this situation. This abnormality is illustrated in fig. 2, which shows a portion of the pars ciliaris retinæ carried over by the displacement of the lens in the same case of microphthalmos. I owe the specimen to the kindness of Dr. Hood, formerly house-surgeon to the York Road Lying-In Hospital. The epithelium is adherent to the mesoblast which surrounds the lens. It will be seen that on both sides it consists of the normal single layer of low cells, while in the centre it is composed of many layers (usually about 5 to 6), and is bounded on one aspect by a definite membrane—the limitans externa, and on the other by a thinner less definite line—the limitans interna. This aspect faces towards the abnormal mesoblast in the vitreous. The resemblance to embryonic retina is unmistakable, although, as might be expected, rods and cones are absent, The structure occurs in a considerable number of the

sections in the series, and the appearances are not due to oblique cutting. A minor degree of the same abnormality has been described by Fuchs in a six months fœtus.

Although not strictly a congenital abnormality, a peculiar type of tumour of the ciliary body should be mentioned here. The new growth is

Fig. 2. Retina like tissue derived from the unpigmented epithelium of the ciliary body. A. Normal single epithelium, folded at this point. On the opposite side similar cells are seen. B. Structure consisting of many layers of cells, bounded towards the mesoblast in the vitreous by a thin limiting membrane (limitans interna), and on the opposite side by a thicker membrane, best seen on the left (limitans externa). C. Mesoblast in the vitreous. D. Lens capsule.

unpigmented, and grows from the ciliary body inwards towards the equator of the lens, and forwards along the posterior surface of the iris. It consists of strands of cells which are partly single-layered, like the normal epithelium of the ciliary body, *partly many layered, and entirely similar to embryonic retina*; rudimentary rods and cones may even be found. A proper mesoblastic stroma is absent. By special staining methods, Verhoeff was able to demonstrate the presence of neuroglia, and, indeed, parts of the tumour consisted almost entirely of neuroglia; this corresponds therefore with II, 2, d of the schema. Four certain instances of this form of tumour have been described by Badal and Lagrange, Emanuel, Verhoeff, Kuthe and Ginsberg; there are also two doubtful reports by Helferich and Borst. Although described under different names, there can be no doubt that they form a group quite by themselves. Fuchs, who had the opportunity of examining sections from several of the cases, speaks of their "astonishing similarity." They always occur in children ($2\frac{1}{2}$ to 8) which shows that they have probably at least a congenital foundation. A local infiltrating malignant tendency is also shown, and although they differ widely in structure from ordinary gliomata of the retina, they seem to be more nearly related to them than to any other kind of intraocular growth, forming, in fact, the corresponding tumour in the ciliary region.

The other possible abnormalities of the ciliary body do not seem to have been observed; these are: the outer layer unpigmented (II, 1, b); the outer or both layers consisting of retina (II, 1, c, II, 3, c); the outer or both layers consisting of neuroglia (II, 1, d; II, 3, d).

III.

On the choroid the external layer may consist of unpigmented epithelium (III, 1, b).

This is an abnormality comparatively frequently met with in coloboma of the choroid. A "leucosis" of the pigment epithelium seems indeed to be the minimal form of that condition. Pause, for instance, has reported a case in which it was the only abnormality present, both the choroid and the retina being normal. I have had the opportunity of examining an instance only slightly greater in degree; it occurred in a case reported by Mr. J. Herbert Parsons and myself. The right eye was greatly displaced by an orbital encephalocele, and showed three colobomata, one on the nasal side of the papilla, one of the nerve entrance, and one at the macula. In the macular coloboma the pigment epithelium was absent, but islands of unpigmented epithelium were present here and there on the surface. The choroid was poorly developed, but showed no gap, while the retina was not adherent, and was structurally but little altered, an imperfect, but quite recognisable, fovea being present. Everywhere else the epithelium was fully pigmented.

Another instance of the same abnormality is described in the next subsection; in that case, however, the unpigmented epithelium was not isolated, but led up to retina in much the same manner as the epithelium leads up to retina at the ora serrata; this transition from unpigmented epithelium to retina is common near the edge of colobomata of the choroid.

On the choroid the external layer may consist of retina (III, 1, c)

This gives rise to the interesting condition known as doubling and inversion of the retina. The term "inversion" denotes that the external layer of the retina is outside-in, with its nerve fibre layer towards the choroid, and its rods and cones towards the interior of the eye. The original observations of doubling is due to Haab (1878); inversion was noted in passing by Deutschmann (1881), but Kundrat (1885) seems to have been the first to see its importance, and to attempt an explanation. Doubling has been described almost exclusively in colobomatous eyes, either within the coloboma or not far from its edge; Salzmann saw it in an inferior crescent, but the fundus had not been seen with the ophthalmoscope, and the case was probably one of true coloboma. Inversion has been reported mostly in the retina lining extra-ocular cysts associated with microphthalmos, but in such cysts the ordinary arrangement may also be found. It is probable that when the retina is doubled one layer is always inverted; on the other hand, inversion may occur without doubling in microphthalmic cysts.

It is but natural that these peculiar arrangements should have aroused much speculation. Attention has been directed chiefly to the explanation of inverted retina in microphthalmic cysts. It is evident that if the retina simply followed the other tunics as they became ectatic, or if it grew or were pushed through a hole in them, it must still retain its normal arrangement, with the rods and cones outermost. The problem, therefore, is to get the retina, or rather (since the foundation of all these abnormalities is undoubtedly laid in early fœtal life), the layer of the optic vesicle which is destined to form the retina, into the cyst in a reversed manner. The following are the chief explanations which have been offered:

(1) *Explanation of Kundrat* (Fig. 3).—The names of Czermak and Mitvalsky, who further elaborated this hypothesis, are usually also mentioned. It is supposed that the invagination of the primary optic vesicle to form the secondary is incomplete. If the failure to invaginate were total, part of the

retina-forming layer would remain anterior, the lens would not be within the globe, no proper vitreous would be formed, and the eye must necessary be exceedingly malformed.* It is possible, however, to conceive of invagination proceeding normally in front, although the cleft did not reach so far back as

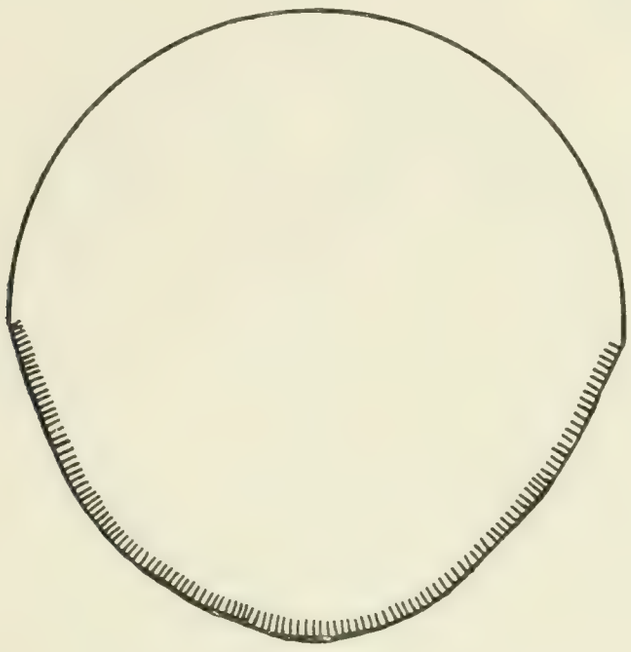

Fig. 3 Kundrat's explanation of inverted retina.—In all these diagrams the plain line represents the portion of the vesicle which should normally develop into pigment epithelium; the toothed line shows the portion which should develop into retina, and the teeth show the direction of the rods and cones. The normal arrangement is shown on the right hand side of Fig. 6.

usual, and in that case a small posterior portion of the vesicle might remain uninvaginated. As a result the anterior parts of the eye and the vitreous would be normally formed, while the uninvaginated portion of the vesicle would develope into retina with a reversed arrangement (see fig. 3). If now the tunics became ectatic, their normal development being perhaps hindered by the presence of the uninvaginated portion, the inverted retina would be pushed into the cyst.

Against this ingenious hypothesis there are weighty objections. In minor degrees of microphthalmos with cyst, both the anterior parts of the eye and the nerve are not infrequently fairly well-formed, the opening into the cyst cavity being below the nerve. On Kundrat's hypothesis, this would require the invagination of the vesicle in front and behind, while a small intermediate portion remained uninvaginated. It is difficult to imagine how this could occur. Again, the portion of retina which lines the cyst would have belonged to the upper part of the globe if invagination had not failed; there should therefore be a defect in the retina above the nerve, and this is not the case in these instances. The strongest argument against Kundrat's hypothesis, however, is, that it cannot explain the association of inversion with doubling; where there has been no invagination of the optic vesicle there cannot possibly be two layers of structures derived from it.

(2) *Explanations of de Lapersonne and Gallemaerts* (Fig. 4).—These two are very similar. The invagination of the optic vesicle and the formation of the fœtal cleft are supposed to occur as usual. While the fœtal cleft is still open a fold of the inner layer of the secondary optic vesicle is thrust through

*For a case approaching this degree of malformation *see* Johnson Taylor and Treacher Collins T.O.S., Vol. XXXVI, 1906, p. 177.

the gap, in the manner shown in Fig. 4. Gallemaerts believed the extrusion of the inner layer to be due to abnormal pressure transmitted from the cerebral vesicle down the hollow optic stalk; this idea may be considered definitely disproved, both by the rarity of the association of microphthalmos

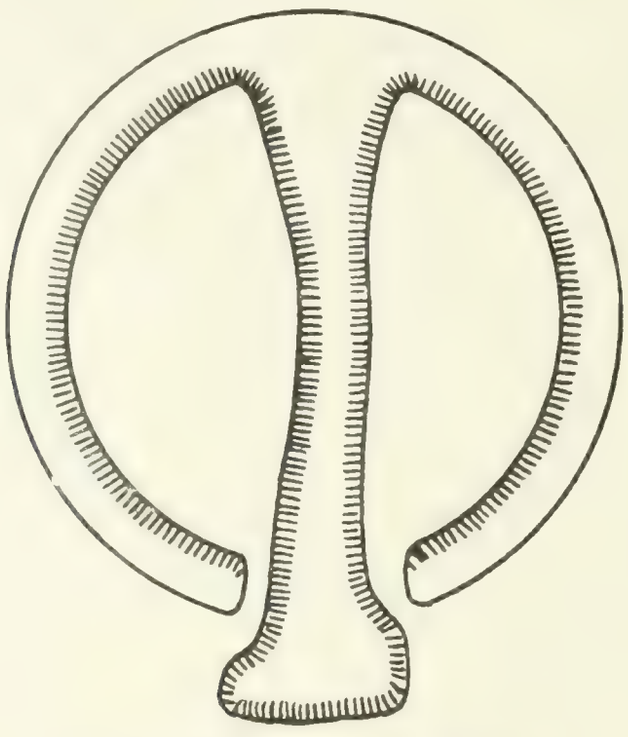

Fig. 4. Explanation of Gallemaerts.

with cerebral defects, and by the researches of v. Hippel, which show that the starting point of colobomata and allied conditions is to be found in the persistence of mesoblast in the fœtal cleft, not primarily in an abnormal condition of the cerebral vesicle. Gallemaert's explanation is unnecessarily complicated. The disadvantage of deriving the retina in the cyst from the upper part of the vesicle is obvious.

de Lapersonne explains the extrusion more simply as being due to the thrusting out of an exuberant fold of the plicated retina.

(3) *Explanation of Pichler* (Fig. 5).—This hypothesis was foreshadowed, if not stated in detail, by Becker; it is as follows.—If the fœtal cleft fails to close, the inner and outer layers of the optic vesicle remain continuous with one another at the edge of the fissure, instead of fusing each with its corresponding layer of the opposite side—retina with retina, and pigment epithelium with pigment epithelium. It may be supposed that the developing pigment epithelium is a tissue relatively inert as compared with the developing retina; it will therefore lag behind in growth, its point of junction with the retina will be displaced outwards, and a fold of retina with an inverted arrangement will be formed: or alternatively, if there be a gap in the ocular tunics the fold will be thrust out into the orbit and will form the inverted lining of an orbital cyst (Fig. 5). The amount of folding will be increased by the lack of room in the microphthalmic globe.

This explanation would undoubtedly account well for duplication close to the edge of colobomata, and is indeed very probably correct for that condition; it would also account fairly well for inverted retina in orbital cysts. But it is not so satisfactory for cases in which there is little evidence of excessive proliferation of the optic vesicle—where the globe is of full, or nearly full, size,

and where both the inverted and the uninverted layers of retina form an even, unfolded, or only slightly folded, lining. Nor can any mere folding or proliferation explain the frequent association of unpigmented epithelium with

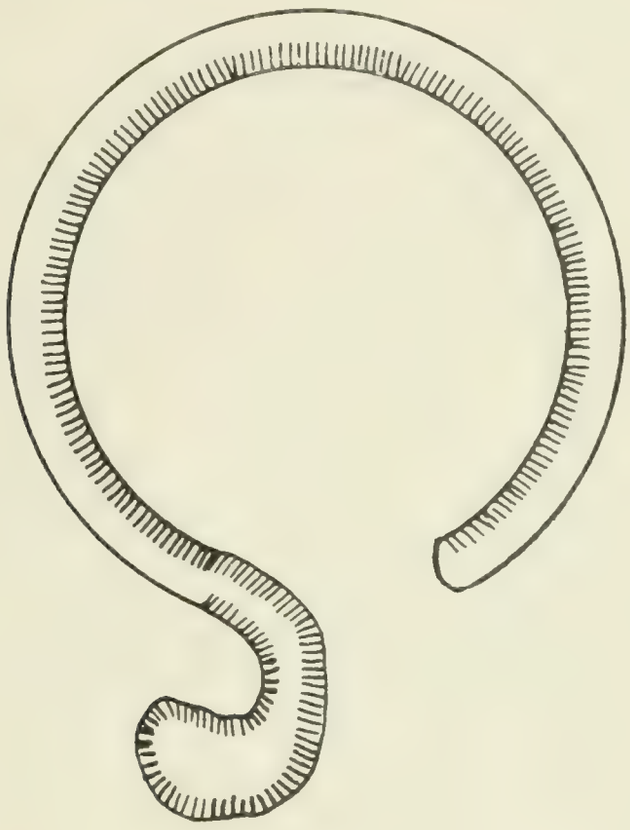

Fig. 5. Explanation of Pichler.

inverted retina, since unpigmented epithelium is a tissue foreign to the posterior part of the globe. Still less can patches of inverted retina which are entirely isolated among unpigmented epithelium be explained by folding or proliferation (see below).

(4) The hypothesis of the metaplastic development of the outer layer of the secondary optic vesicle into retina was used by Haab to account for doubling before inversion had been observed; it is mentioned only to be rejected by a few subsequent authors. It seems to me, however, that it accounts for the facts of doubling and inversion much better than Pichler's explanation, and it has the additional advantage of linking these conditions with all the other abnormalities here described; an explanation which covers a large number of cases is more likely to be true than one which deals with only a few.

A moment's consideration will show that if the outer layer of the optic vesicle developed into retina, that retina must of necessity be inverted; for the inner layer of the vesicle is continuous with the outer at the pupillary margin, and at the edge of the fœtal cleft, so that the outer surface of the inner layer (*i.e.*, the rod and cone surface of the retina) corresponds with the inner surface of the outer (Fig. 6.). The same fact may be stated in broader terms. In every sense organ derived from epiblast (including the invertebrate eye) the recipient elements are developed on the superficial aspect of the cells, and the conducting elements on the deep aspect. This follows, of course, from the fact that the stimuli to be appreciated arrive on the external surface. The vertebrate eye, however, is no longer formed, like the invertebrate, as a simple superficial downgrowth, but by a series of complicated invaginations. The

surface, originally superficial, becomes the inner aspect of the neural canal, of the optic stalk and of the outer layer of the optic vesicle, and the outer aspect of the inner layer of the optic vesicle. In the normal retina, therefore, the percipient elements (rods and cones) are developed from the aspect which was originally superficial, even though this involves the presentation of the reverse side to the stimulus, and, in consequence, the acquisition by the tissues of the

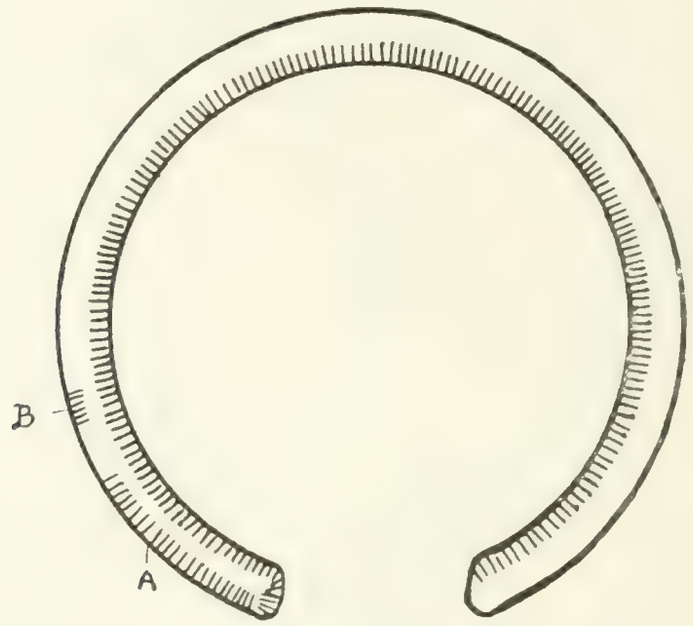

Fig. 6. To illustrate metaplastic development of the outer layer of the secondary optic vesicle into retina (at A). The isolated patch of retina at B, corresponds to the patch B in Fig. 7. Displacement or folding cannot account for such an area. The diagram shows why the outer layer of retina must be inverted.

unusual quality of transparency. If now the outer layer of the vesicle were to develop rods and cones these also would be produced on the aspect originally superficial, and this, as stated above, is the inner aspect. The retina would therefore be reversed.

In illustration of these points I may refer to a case of cyclopia, from which Fig. 7 is derived. I owe the specimen to the kindness of Lieut.-Col. H. Herbert, I.M.S. The scleral and choroidal partition between the two eyes had disappeared, and the retinæ on the nasal side of each had partially fused; the irides were malformed; the lenses were somewhat displaced backwards; there was mesoblast with small *plaques* of cartilage in both vitreous chambers.

On the temporal side of both eyes the retina was doubled and inverted for a distance of about 4 mm. in one eye and 3 mm. in the other. Anteriorly the epithelial lining of the choroid was normal (Fig. 7, a); on following it backwards in the section shown in Fig. 7, it is seen to be replaced by a small area of inverted retina (*b*); then comes an extensive zone lined with unpigmented epithelium (*c*); and, finally, one meets with inverted retina (*d*), which extends from this point to the nerve. The small patch of inverted retina (*b*) occurs in only a few sections of the series, and is entirely isolated from the inverted retina further back. This is a very important point, because such an isolated patch of retina cannot be accounted for by any process of duplication at the edge of the cleft, of the kind hypothecated by Pichler. It can only have originated by abnormal metaplastic development of the outer layer of the vesicle into retina.

Where this patch was not present the sequence from before backwards was as follows: the distribution of the pigment in the epithelium first became

irregular, groups of pale, or totally unpigmented cells being interspersed among the normal; then followed a considerable area in which the cells were unpigmented; finally, these cells were replaced by a layer of retina with its nerve fibre layer directed towards the sclera, and its rod and cone layer

Fig. 7. Inversion and doubling of the retina in a case of cyclopia. A. Pigment epithelium lining the choroid. B. An isolated patch of inverted retina. C. Unpigmented epithelium. D. Inverted retina which is continuous from this point to the papilla. E. Retina with normal arrangement of layers. From the point A onwards the choroid is defective.

abutting on the subretinal space. Before merging into the retina, and also in certain small areas elsewhere, the epithelium was sometimes more than one layer thick (up to 4 or 5); this represents a transition towards embryonic retina similar to that already described in the ciliary body. (p. 726) In one eye the inverted retina was as well-formed as the non-inverted (*e*); in the other its structure was more confused, and the rosette-like rings so common in congenitally abnormal retina, were present. On this side, therefore, the inversion was not so striking, though perfectly distinguishable.

In an area closely corresponding in extent to the inverted retina the choroid was defective; it was thin and imperfectly differentiated from the sclera. Near the edge of the nerve entrance, but separated from it, there was a defect in the sclera in one eye, in the form of a little flask-shaped cavity, which projected slightly beyond the contour of the globe. It was lined partly by a layer of inverted retina directly continous with the inverted retina within the globe, partly by an imperfectly differentiated cellular tissue derived from it. The area of inverted retina and defective choroid was in the lower part of the globe. There were two papillæ which were much malformed, and had mesoblast projecting from them into the vitreous. The nerve was single. At the edge of the papilla they inverted, became continuous with the normal retina of the same side, and nerve fibres were contributed to the nerve by both layers. Vessels were present in the inverted retina; they were small and contained no blood.

The defective area in this case evidently represents a coloboma of the

choroid. It was not ectatic, except at one small spot, but it is known that colobomata are not necessarily ectatic, the expansion being a secondary phenomenon, due to the weakness of the tunics. The little flask-shaped defect in the sclera was plainly a minimal form of orbital cyst, such as is usually associated with microphthalmos. It is very important to note that the cavity

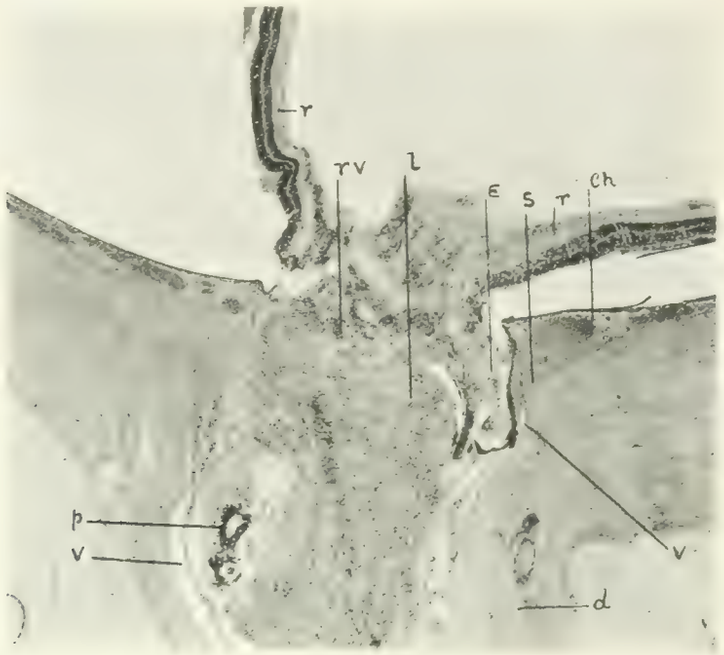

Fig. 8. From R. L. O. H. Rep., Vol. XVII, Pt. ii, 1908. Retinal inclusions in the nerve. E. Pocket of retina within the nerve. It is filled with distorted nervous tissue, and is lined with an epithelium partly pigmented, partly unpigmented, continuous with the pigment epithelium within the globe. p. Retina elements far up the nerve. It was proved by means of serial sections that they had no connection either with the pocket on the other side of the nerve, or with the intraocular retina. r. Retina. rv. Retinal vessel. l. Lamina cribrosa. s. Sclera. ch. Choroid. v. Intervaginal space. d. Dural sheath of nerve.

communicated not with the vitreous, but with the subretinal space. This is a point to which insufficient attention seems to have been directed, but if the relations of parts are not too much distorted, it will probably be found that a cyst lined with inverted retina always communicates with the subretinal space ; for whether the inverted lining be explained as due to duplicature, or to metaplasia of the outer layer of the vesicle, it is in either case formed as a pouch from the space between the two layers of the secondary optic vesicle, *i.e.*, from the subretinal space (*See Figs.* 5-6). On the other hand, cysts lined with non-inverted retina will probably always be found to communicate with the vitreous ; for these cases are probably due to the pushing-out of the retinal layer of the vesicle from its vitreous surface, and therefore with the rods and cones outermost. The outer layer of the vesicle must also be thrust out at the same time, but it either forms pigment epithelium in the normal manner, or, perhaps more frequently, is atrophied beyond recognition. Evidently, however, cases such as the present, which are suitable to determine these points, must be of rare occurrence, for with enlargement of the cyst there goes increasing distortion and confusion of relations.

Of the other possible abnormalities on the choroid neuroglia seldom occurs as a tissue by itself, but it is found both in the inverted and in the non-inverted retina, and may constitute the bulk of the tissues when, as not infrequently happens, the nervous elements are ill-developed (III, 1, d ; III, 2, d ; III, 3, d). In a case of microphthalmic cyst Hess found a lining of neuroglia continuous

with, and directly derived from, the outer layer of the vesicle. The replacement of retina by pigmented or unpigmented epithelium does not seem to occur (III, 2, a ; III, 2, b).

IV.

In the optic nerve pigment epithelium, unpigmented epithelium, and retina may be found (IV, a ; IV, b ; IV, c)—that is to say, that all the possible abnormalities may occur.

A case of this kind has been reported by Monthus and Opin, and I have observed it in both eyes of an anencephalic child which was born at term

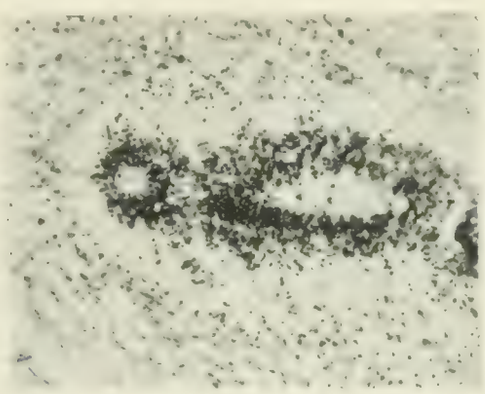

Fig. 9. Higher power view of a retinal inclusion.

(Figs. 8 and 9). Within the globe the retina and pigment epithelium were normal. In the nerve the retinal elements occurred in two situations : (*a*). At the edge of the nerve entrance there was a deep pocket (E), lined partly with pigmented and partly with unpigmented epithelium. The pocket was wholly within the limits of the nerve, and did not encroach upon the adjacent choroid or sclera. It was filled with distorted retinal elements, which were in direct continuity with the intraocular retina. This is the condition which I believe to be the pathological basis of the ophthalmoscopic appearance known as " crater-like hole " of the optic disc. The reasons for this assumption have already been given in another paper ; I need not enter into the subject in this place.*

(*b*) Further up the nerve little patches of retina and of pigment epithelium occurred (p). As might be expected, the retina within the nerve was a good deal distorted, but showed in places a distinct limitans externa, with traces of rods and cones on one side, and nuclei resembling the external nuclear layer on the other (Fig. 9). The complete isolation of these patches, both from the intraocular retina and from the pocket at the edge of the nerve entrance, was proved by means of serial sections. These abnormalities were present in both eyes. The nerves showed the complete absence of nerve fibres usually found in anencephaly. That the optic stalk had been invaginated was proved by the presence of central vessels in the usual situation.

It might be supposed that these inclusions were due to the thrusting-out of portions of the intraocular retina and pigment epithelium into the nerve, favoured by the excessive room left by the absence of the nerve fibres. At first I was inclined to this view, which may indeed be the correct explanation of small inclusions in colobomata at the nerve entrance. But in the present

*Without knowledge of this paper Lauber (*Zeitsch. f. Augenh.*, Vol. XXI., p. 494, 1909) has since reported the same anatomical characteristics in a case of crater-like hole which had been seen with the ophthalmoscope. In a personal communication he fully agrees as to the indentity of his case with mine.

case no coloboma was present, and such an extrusion of the intraocular retina must necessarily have been associated with a defective amount within the globe, especially as the total quantity in the pocket and elsewhere was considerable. No such a defect was present however; the ora serrata was in its usual situation, and between that point and the nerve entrance the retina was rather in excess, being thrown into small folds, such as are common in fœtal eyes.* The complete isolation of the patches in the present instance, and their situation far up the nerve are also against an origin by extrusion; it is difficult to believe that all trace of the original connection with the intraocular retina could so completely disappear.

Conclusions.

Of the abnormalities shown in the schema on p. 725, nine have actually been observed, namely:—(1) pigment epithelium, (2) retina, (3) neuroglia, replacing the unpigmented epithelium of the ciliary body; (4) unpigmented epithelium, (5) retina, (6) neuroglia, replacing the pigment epithelium of the choroid, (7) pigment epithelium, (8) unpigmented epithelium, (9) retina in the nerve. Possibly, other instances are buried somewhere in the enormous literature of congenital abnormalities. It seems to me that these diverse observations can be linked together only by the hypothesis stated in the beginning of this paper—that in congenitally abnormal eyes a portion of one layer of the secondary optic vesicle may develop into structures which normally originate in the other, or in a different part of the same, layer. This species of metaplastic development is not an isolated phenomenon in the domain of congenital abnormalities; the *plaques* of cartilage which are frequently found in connective tissue strands in the vitreous, furnish an example of the production by mesoblast of a mesoblastic structure which is never normally present in that situation. In a precisely similar manner, inverted retina, pigmented ciliary epithelium, retinal inclusions in the nerve, etc., are examples of the production by epiblast of epiblastic structures not normally found in the same position.

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* A striking contrast may be drawn between this case and one reported by Bach (*Arch. f. Ophth.*, Vol. XLV, Pt. I, p. 1), in which there was a small extrusion of retina into the inner layers of the *dura mater* beside the nerve (minimal form of microphthalmic cyst); in this case the retina of the same side was deficient by an amount corresponding to the part extruded.

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ON THE TREATMENT OF DETACHMENT OF THE RETINA.*

BY

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I FEEL proud of the honour you have shown me in inviting me to perform my operation for detached retina before this competent congregation of colleagues, but I feel at the same time satisfied that I am allowed to show you an improved method of treating a disease which has always been regarded as nearly, if not altogether, incurable, and for the adoption of which I have striven for many years.

You are probably aware that I have devised two methods of operation, a simple one, *viz.:* bisection, and another, a little more complicated, *viz.:* the injection into the eye of the sterile vitreous humour of certain animals. Bisecting is the principal method, practicable in all cases of detached retina: the other method is reserved for cases which are otherwise hopeless. In THE OPHTHALMOSCOPE, Vol. V, No. 8, edited by my friend, Mr. Sydney Stephenson, I described exactly the *technique* of both operations; to that description I beg to refer you.

Before proceeding to the performance of my operation, I shall repeat only what it is essential you should know. I shall also avoid any long theoretical exposition of the possibility of the effect of my operations, inasmuch as a quite satisfactory theory of the origin of detached retina has yet to be found. The principal thing is the practical clinical result, and that speaks clearly enough for the superiority of my operative treatment. The proof lies in my statistics. The best figures known to me are those of Horstmann, with 6·6 per cent. of cures, and those of Uhthoff, with 7·5 per cent. I had treated up to the 1st of July, 260 patients with 345 eyes affected with detached retina. Of those 345 eyes I had operated upon 302: the treatment was completed upon 267 eyes. Of those 267 eyes were

cured	70 = 26·1	per cent.
improved	94 = 35·2	,,
not cured	103 = 38·7	,,

If I subtract those patients on whom the operation was performed as an experiment only, without any chance of recovery (as they were informed before the operation) the number of eyes

cured	= 31·1 per cent.
improved	= 41·3 per cent.
not cured	= 27·6 per cent.

*Read July 15th, 1909, at the Oxford Ophthalmological Congress.

But in another way also my figures are very instructive, namely, in showing the relation of the different refractions to the detachment of the retina: thus, there existed in the 345 eyes

Myopia of	1D.— 6D.,	in	52=15·5 per cent.
,,	,, 7D.—12D.,	,,	50 14·4 ,,
,,	,, 13D. and more	,,	57=16·1 ,,
Emmetropia		,,	42=12·1 ,,
Hypermetropia		,,	8= 2·3 ,,

Seven of the emmetropic cases were said to have acquired the disease through a lesion.

Fifteen of the 57 myopic eyes with myopia of 13 and more diopters were operated upon by discission of the crystalline lens; from 9 eyes cataract was extracted without any or any remarkable myopia before. On 51 eyes the refraction could not be fixed; in these cases the other eye had a myopia of

1D — 6D.,= 11.
7D.—12D.,=20.
13D.— more=17.

Supposing that in such cases the myopia of the affected eye was at least the same, I find myopia of

1D.— 6D.,	63	18·2 per cent.
7D.—12D.,	70=20·2	,,
13D. and more	74=21·1	,,

It is not possible to fix the refraction of 4 eyes which had a detachment of the other one, and of 66 eyes with detachment of both retinæ, but of these 23 may certainly have been myopic before. Therefore I count 231 myopic eyes of 345 affected eyes *in toto*=66·9 per cent. myopia of all eyes with detached retina. Both eyes of the same patient were affected 85 times out of 260,=32·6 per cent., of these 47=55·2 per cent. were myopic.

There is still one point that I would mention, that is the tension of the affected eyes. Lauber reports 53 cases of detached retina where the tension was diminished in 48 cases, and adds: "this experience proves that in a great majority of cases the tension of the eyes was diminished." I found the tension of the affected eye diminished in 45 only of 345. My experience, therefore, does not confirm that of Lauber.

Now, before I perform the operation called bisection, let me formulate certain rules, which are of the greatest practical importance:

(1) Never operate upon a recent detachment so long as the detached part is situated in the upper part of the fundus oculi. The best way is to wait, without treating the patient, until the sub-retinal fluid has gravitated downwards.

(2) As a rule, make the bisection with a double-edged linear knife *downwards* in the anterior boundary of the *cul-de-sac*.

(3) Bisect horizontally, guide the knife tangentially to the eyeball, from downwards and outwards to downwards and inwards.

(4) Make the bisection as quickly as possible in a straight direction through the eyeball, avoiding junction at the spot of the counterpuncture, and draw back the knife in the same way as it was introduced.

(5) Turn the blade a little on the spot of the puncture, so that the retinal and eventually the pre-retinal fluid can escape.

(6) Do not repeat the operation if the first has had by any chance an unfavourable result, say, by wounding one of the larger retinal vessels, or by some other unexpected event equally rare.

(7) Speaking generally, the operation can be repeated twenty times or even oftener, if necessary, with sufficiently long intervals between successive operations, according to the reaction shown by the eye.

(8) Apply the bandage—or better, a celluloid shield—quite loosely for the first 24 hours on both eyes, then only upon the one which has been operated upon for 4-5 days.

(9) Apply atropine to the operated eye during the whole treatment.

(10) Keep the patient in bed for 7-8 days after every operation.

As a rule, if these directions are followed and the bisection is carried out under strict asepsis, the operation is without any danger to the eye.

The *technique* of the operation of the injection of sterile animal vitreous body is as follows:—the syringe, filled with prepared animal vitreous, is introduced first in the region of the ora serrata outwards and downwards. The assistant holds the syringe steadily while the operator makes a simple bisection downwards. After having made it, he takes the syringe, and, pushing the syringe forward—it is only possible to push it forwards—he injects a certain quantity, according to the consistency of the eyeball. Then, the syringe is withdrawn and the puncture closed for some minutes with a pair of toothed forceps. Both eyes are loosely bandaged for 24 hours ; then that which has been operated upon only for 6-8 days. Further measures depend upon the reaction. The latter is never dangerous if one uses for the first injection a weak animal vitreous, that is the ready-prepared one, diluted with the same quantity of physiological salt solution. In any case the human vitreous becomes more or less cloudy and clears up again in the course of weeks or months. If any stronger reaction sets in, it is only necessary to prescribe atropine and warm fomentations. Under all circumstances this operation is to be reserved as a last refuge—do not expect more of it than is possible in hopeless cases. I have treated 68 eyes by this method. With repeated injections :

3 were cured.
26 were improved.
38 were uncured.
1 is still under treatment.

With regard to the way in which my methods act, I believe it may be explained as follows.—By the bisection I reduce the retinal tension, which, judging by my experience in cases of detachment of the membrane, can be so strong that it is impossible to re-attach it without making one or several incisions. I evacuate the retinal, and eventually the preretinal fluid, and I try to produce small adhesions by hæmorrhages between the retina and choroid. With the injection of animal vitreous body, I try to obtain, not only a mechanical pressure of the detached retina against the choroid, but also a firm welding of both membranes on an inflammatory basis, with simultaneous better re-filling of the eyeball. Relapses certainly may occur under both methods ; in such cases I can use both again, in order to regain what has been lost.

KEROTOMY.

BY

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THIS operation was devised by my father, George Edward Walker, in 1886, and described in his article "On the treatment of some of the graver inflammations of the cornea," in the *Liverpool Medico-Chirurgical Journal* for 1889; but it has never attained that recognition which it merits, perhaps because, as he used to say, half humorously, half sadly, it was entombed in the pages of the local journal.

The operation is simple, and is best described in the original words: "Standing behind the recumbent patient, insert the speculum and fix with toothed forceps the conjunctiva opposite the lowest point of the cornea. Then thrust a broad needle through the sclera, just behind its junction with the cornea, until the shoulder of the needle is visible in the anterior chamber. Of course the blade must be held nearly parallel with the plane of the iris, but the puncture should be oblique and valvular, so that on the withdrawal no aqueous escape."

"This puncture should be repeated until the circumference be traversed. In severe cases the bridge between the incisions should be of the same width as the incisions themselves: in cases of less gravity twice or thrice the width. I am in the habit of making about two-thirds of the incisions with the right hand and the remainder with the left."

"If carefully performed, the operation causes no loss of aqueous, or if it does, the fluid is replenished rapidly, so that the anterior chamber is as full after the operation as before. It is important to operate so as to ensure this, in order to prevent the additional pain consequent on an empty chamber, and what is more important still, to enable one to complete the incisions without endangering the lens."

To this description some minor details may be added:

The operation is more easily performed if the iris is contracted, as the relation of the point of the needle to the lens can be more clearly seen; but, provided that the point is entered well behind the corneo-scleral junction, and kept well up in the anterior chamber, there is no danger of wounding the lens even when the pupil is dilated. The keeping up of the point of the needle is also a safeguard against any sudden movement or squeeze by the patient, and if this precaution be observed, the operation is free from danger. Indeed, I have never heard of an accident from its use. The number of incisions averages about ten, but varies with the width of the broad needle and with the severity of the inflammation. It is advisable to make the lower incisions first, in order that the bleeding, which should be free, may not obscure the field of operation.

Except in children, local anæsthesia only is necessary, but it must be remembered that, owing to the congestion, longer preparation is required than for cataract or other operations on the uninflamed eye. Usually, the pain is not severe, but if the aqueous be allowed to escape, the sudden alteration in tension causes a twinge. The patients often say that, after the immediate smarting has passed away, they have been relieved of the previous dull aching.

I believe that kerotomy is based on sound pathological principles, and that its curative action lies in the free drainage of the cornea and the relief thereby afforded to the condition of stasis in the lymphatic channels, or, to

express it in language of present-day theory, in the removal of toxic substances and the substitution of fresh immunizing fluids. This explanation is similar to that given by Axenfeld of the action of paracentesis, but the action of kerotomy is much more powerful, as it directly relieves the cornea itself, while it is free from the dangers of paracentesis, *i.e.*, of causing cataract, anterior synechia, and prolapse.

The obvious criticism of the operation is that it is bad surgery to make incisions into the interior of the eye when the exterior is in a condition of inflammation. This criticism applies equally to paracentesis and Guthrie's operation, and in the present indefinite knowledge of causes of corneal inflammation, and of the virulence or non-virulence of the various organism found in the conjunctival sac, it is difficult to answer theoretically; but in eight years personal experience of the operation, during which time I have seen it performed or performed it myself at least 1,000 times, I have never known a case in which the operation has caused septic infection of the interior of the eye.

The reason which led my father to devise this operation was the following. He had been impressed by the value, and also by the disadvantages, of the operation of cutting across a severe ulcer from clear cornea to clear cornea, which Guthrie had advocated in his lectures published in the *Medical Times* of February and March, 1844, and which was revived by Saemisch, and which now unfairly bears his name. But in the autumn of 1886 a case of severe chronic inflammation of the cornea, which had resisted orthodox treatment for months, was brought to my father, and he found when the eyelids were opened under an anæsthetic, that Guthrie's operation was inapplicable, as there was no definite ulcer, but the whole cornea was in a condition of pannus. He had seen cases, in the practice of others, where the treatments then advocated for this condition, *i.e.*, peritomy, pericorneal cauterization, production of acute inflammation by jequirity beans or by gonorrhœal pus, had been used disastrously; and, to continue in his own words:

"With such an experience as this, I was unlikely to try any of these heroic measures on the case in question, and inasmuch as there were no foci of inflammation on which to practise Guthrie's method, I was in a difficulty. I knew that all ordinary means had been tried, so it was useless repeating these. If I cut across the cornea, as I had done in cases of purulent ophthalmia where there was no alternative between so doing and awaiting total destruction of the cornea, doubtless I should relieve. But in this case, though it was grave, there was no immediate necessity for doing that which, though it would certainly relieve and most likely cure the disease, would entail on the eye the permanent disadvantage of a long dense scar, causing both obscuration of sight and disfigurement I therefore put this method aside, and proceeded to adopt an idea which seemed to spring all at once into my mind, but which doubtless was the outcome of much pondering over the difficulties of which I have been speaking."

"If a diametrical incision would relieve even worse corneal tension than that which I had before me, why should not a series of shorter incisions, whose total length should be equal, or nearly equal, to the length of the diametrical incision, do the same? And if so, why should not these shorter incisions be made at the base of the cornea, where they would cause neither damage to the sight nor disfigurement?"

"In less time, perhaps, than it has taken to record this, I conceived and performed the operation, the amount of blood and serum which escaped from the incisions showing what a relief had been afforded to the cornea, which cleared up perceptibly whilst the operation was proceeding."

"This clearing up is a very striking feature in the operation, and has often been remarked by those who have witnessed it."

"All doubt as to the benefit of the method was soon removed. After recovery from the chloroform, the girl expressed herself as quite relieved from the old pain, and two days afterwards spontaneously opened her eyes, for the first time in three months."

In this way was devised an operation which was destined to prove, in his hands, of the utmost utility in the treatment of all forms of grave corneal inflammation. Just as corneal inflammations are, excluding errors of refraction, the commonest troubles of the eye, so kerotomy soon became the operation most frequently performed in his practice, and in the remaining twenty years of his work he must have done it on between three and four thousand cases.

It has stood the test of time, and now, twenty years after its inception, it remains the operation of choice, indeed almost the only operation employed in these cases at St. Paul's Hospital. The scope of its use is wide, and it is indicated in any grave inflammation of the cornea, whether acute or chronic; but its most brilliant successes are obtained in cases (such as that described in the passage just quoted) of the chronic eczematous inflammation which used to be misnamed "strumous ophthalmia."

The concluding sentence of my father's article so well sums up the after-experience of himself and of the present writer that it forms a fitting end to this note:—

"As this method has for a long time been gradually superseding all others, and as it has in the last four months entirely done so in my practice, and as I have never seen reason to regret using it, whilst I have repeatedly seen reason to regret doing anything else, I beg respectfully to bring it before you, and to recommend its adoption."

CLINICAL MEMORANDA.

NOTE ON A CASE OF "HOLE IN THE OPTIC DISC."

BY

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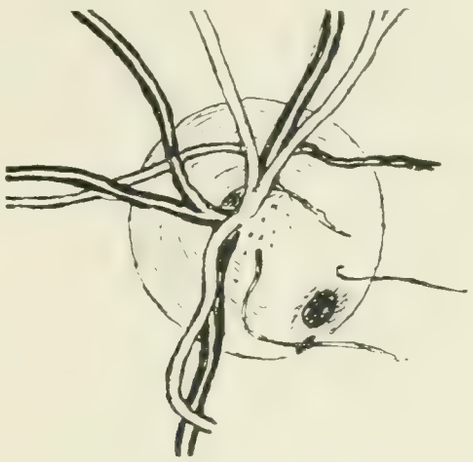
I have recently come across a case of "hole in the optic disc," very similar to that described by Mr. Sydney Stephenson in The Ophthalmoscope for February of this year, and have therefore thought that a brief note on the case might be of interest. I subjoin the description:—

Clara S., *æt.* 12, attended the out-patient department of the Birmingham and Midland Eye Hospital, on September 4th, 1909, complaining of daily headaches, during which she could "only see the half of things."

On examination, R.V.=6/8 L.V.=6/8. The fields and colour perception were normal. Under homatropin, R.V.=6/6 c. + ·25 D. sph. L.V.=6/6 c. + ·5 D. sph. The only fundal abnormality was a condition affecting the left optic disc. Situated close to the temporo-inferior border of the disc was a very slightly depressed area. Within this area, and in a position corresponding to the space between the IV and V on a clock-dial, was a small excavation, rather oval than circular in outline, with prominent overhanging margins. The bottom of this excavation was of a dark greyish-green appearance, and looked quite smooth; but only a small amount of light could be thrown upon it, and on this account it was also difficult to form

an accurate estimate of its depth, which seemed to be about 3 dioptres. A small cilio-retinal artery skirted the upper border of the excavation. The disc margin showed no abnormality of definition or contour in the neighbourhood of the depression.



Besides noticing the close resemblance between the appearances in the above case and the one described by Mr. Stephenson, it is interesting to observe a marked similarity in the histories: for the former also occurred in a young girl, an only child, described by her mother as of a "nervous and excitable disposition," and one who had been brought for examination on account of subjective disturbances associated with headache (symptoms which have not reappeared since the introduction of a mild "tonic" treatment).

I wish to record my best thanks to Mr. J. Jameson Evans, honorary surgeon to this Hospital, for kindly allowing me to publish my notes on this case.

A METHOD OF CATARACT EXTRACTION WITH THE RETENTION OF A CORNEAL-CONJUNCTIVAL BRIDGE.

BY

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SINCE the introduction, about half-a-century ago, of von Graefe's method of extracting the lens by linear incision, ophthalmic surgeons have been content to perform their cataract operations under the conditions laid down by that distinguished surgeon, believing his operation to be the safest and most successful under all circumstances. There are few, however, but will admit that even under the most favourable conditions, his method has certain imperfections, which expose the result to undesirable complications, the greatest of these being the sudden removal of all nourishment from fully one-third of the cornea, whereby union is delayed and resistance to possible microbic infection is diminished. Many attempts, indeed, have been made to combat these defects, but von Graefe's operation to-day occupies the position it did on its introduction into ophthalmic surgery.

Any improvement which will reduce the risk of infection, and the danger of non-union of these delicate structures, is of the greatest importance. With that end in view, I desire to bring under the notice of ophthalmologists a modification of von Graefe's operation, which has given me highly satisfactory results.

It is well-known that the present operation for extraction of cataract consists in making a complete section of the cornea, through the upper segment.

The modification to which I would direct attention consists in performing von Graefe's operation up to a point that leaves a connecting flap about 4 mm. broad, between cornea and conjunctiva. Instead then of completing the corneal section in the usual fashion, the Graefe's knife is carried further up under the bulbar conjunctiva for 10 to 12 mm. and then withdrawn, without cutting through the conjunctiva. We thus have a corneo-conjunctival bridge, which may be broad or narrow, but the broader the conjunctival attachment to the cornea, the greater the chances of success and of speedy recovery.

The object in having a large corneo-conjunctival band is to allow of sufficient bulging to take place, when pressure is applied by a Daviel's spoon on the lower part of the cornea, thus permitting the wound to open widely enough to allow of the exit of the lens, and again to close immediately pressure is withdrawn.

If the surgeon desires to perform iridectomy at this stage, it is best done upwards and inwards. The capsule of the lens may be ruptured, either before or after the iridectomy, from the temporal side.

By these means the operator will feel he has complete command of the eye, no matter how nervous or restless his patient may be.

I claim that by means of the corneal-conjunctival bridge, the continuity between the cornea and conjunctiva being maintained, the nourishment of the cornea is not interfered with to the same extent as in the usual method, where complete division is carried out. Moreover, the parts are kept in more accurate apposition, thereby favouring rapid and certain union. From this it follows that the anterior chamber will be re-established in a shorter period.

The risk of the edge of the upper eyelid getting between the lips of the wound during the operation, or the conjunctival flap turning in upon itself and being caught in the wound, as sometimes happens, is, under this method, impossible. The likelihood of the iris, vitreous, or cortical substance being caught in the wound is less likely to occur from the fact that the "bridge" gives greater freedom for thorough examination.

In sickness from shock in local and general anæsthesia, the "bridge" would act as a safe barrier in preventing the usual prolapse. Suturing the lips of the wound I have never seen, nor do I believe in, but such would be unnecessary with the "bridge." Corneal astigmatism would be less likely to be produced.

In conclusion, should there be any difficulty in the extraction of the lens by this corneal-conjunctival bridge method, the operator can complete his section as in the ordinary von Graefe's operation. By the aid of a pair of fine scissors, he can snip through the band and proceed in the usual way to deliver the lens, but such proceedings in the hands of an expert will be found quite unnecessary.

There is no deviation from the usual after-treatment; but I may remark that in cases operated on by this method, the eye may be examined minutely with less risk of doing harm.

As I have had the best possible results in all my cases, embracing as they do glaucomatous cataract, with fluid vitreous, immature and senile cataract, I have every confidence in submitting the foregoing facts, and I believe they will be found of the greatest value in cataract operations.

NOVELTIES.

A NEW RETRACTOR FOR USE IN EXCISION OF THE LACRYMAL SAC.

BY

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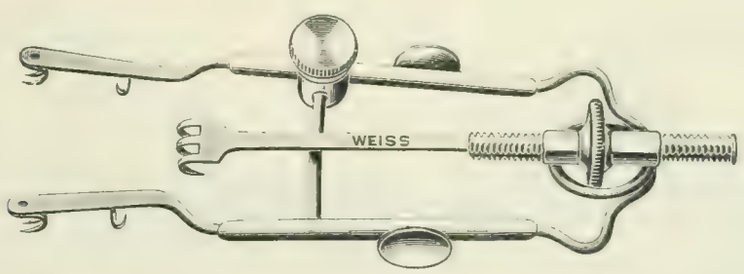
Some form of retractor is almost a necessity in performing the operation of excision of the lacrymal sac. Firstly, to open out the incision, which is awkwardly situated in a narrow place betwixt the inner canthus of the lids and the side of the nose. Secondly, because efficient traction on the tissues provides the best means of checking bleeding. At present Müller's and Axenfeld's tractors are the most generally used.



Müller's is neat and convenient in form, but not sufficiently powerful as a hæmostat. Axenfeld's is large and clumsy, but very efficient as a hæmostat; yet it has a serious drawback in that its large claws drag the wound open vertically, and the upper claw is greatly in the surgeon's way in removing the fundus of the main sac, the complete removal of which is essential to the success of the operation.

The instrument shown in the cut combines the actions of these two forms of retractors. The frame is that of Müller, and it is no larger than his neat model. But, by an alteration of the prongs at the extremity of the laterally acting blades, and the addition of a claw (something like an old-fashioned "back-scratcher") which can be drawn back by the milled nut at the spring end of the frame, this retractor will exert the powerful tractor action of Axenfeld's instrument, and yet leave the upper end of the site of the operation free. In inserting the new retractor the instrument should be first closed, the blades approximated, and locked by a turn of the side check-screw and the long claw pushed home to just behind the side prongs of the lateral blades. The claws are inserted into the wound just as in using Müller's instrument. Now the side check-screw is released, and the blades being forced apart by the spring of the frame, stretch the incision laterally: the side check-screw should now be firmly locked. The blades are then gently pressed into the wound by one finger, and the milled nut at the spring end of the frame turned, so as to draw back the long claw: the front claws on the blades are pivoted and so shaped that they oppose the backward drag of the long claw, so that the incision is stretched tight. The field of the operation is well exposed, and the traction exerted on all sides of the wound acts as a most

efficient hæmostat, yet the important upper limit of the wound is left quite free of any obstruction that would hinder the work of the surgeon.

The instrument is made in excellent fashion by Messrs. John Weiss and Son, Ltd., 287, Oxford Street, London, W.

A POCKET REFRACTOMETER.

BY

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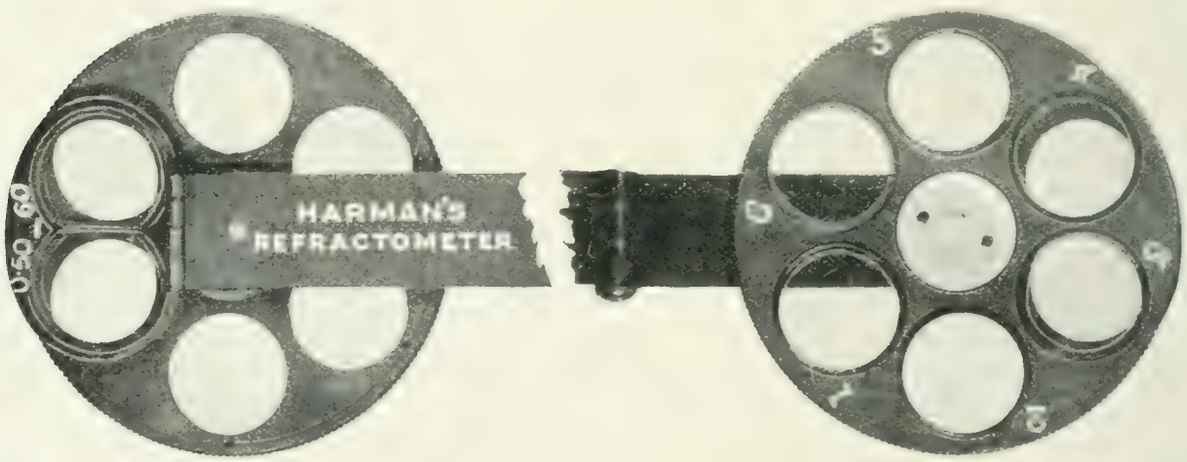
ASSISTANT OPHTHALMIC SURGEON WEST LONDON HOSPITAL.

THERE can be scarcely a man who does eye work who has not regretted on some occasion that he had not at hand a few lenses wherewith to examine the refraction of an unexpected patient. The school doctor, the eye surgeon away from home, and the surgeon on service, each has felt the need of these few



The upper half shows the obverse, the lower half the reverse of the disc's actual size.

lenses. There are portable refractometers, but they are of such a size that no one would desire one of these as a constant inhabitant of the waistcoat pocket.

The figure shows a little instrument that I have carried constantly for the past five years, and found of the greatest service, and because of enquiries concerning it from post-graduate students who have seen it in use at the West London Hospital, I have thought well to publish it.

The instrument provides 36 spherical lenses, 18 concave and 18 convex; the lenses measure half an inch in diameter (12 mm.), and since the average cornea measures 11.6 mm. they are of ample size for subjective or objective examination. Yet when the instrument is closed it measures only $1\frac{3}{4}$ by $2\frac{1}{4}$ inches and weighs $1\frac{1}{2}$ ounces; that is, it is about the diameter of an ordinary watch, but half the thickness, and half the weight.

The instrument consists of two discs carrying six lenses each, they are pivoted on to the leaves of a long strap-like hinge. To the free end of each of these leaves is hinged a small flap carrying two lenses; the flaps overlie and can coincide with the lenses in the discs. The six lenses of a disc can be used alone, or in conjunction with one or other of the two lenses in a flap.

The lenses in one disc and flap are convex, those in the other disc and flap concave. To provide for easy distinction of the lenses, the centre of each disc has a large circular patch of enamel, coloured red or white, to indicate respectively plus or minus lenses; each lens is numbered, and the unit lenses are encircled by a ring of enamel.

It is intended that the disc with the lenses of the sign required should be rotated before the eye of the patient. The disc not in use forms the handle and should be held in the palm of the left hand, the ball of the thumb should rest on the inside ridge of the hinge and the second finger on the outer side thereof; then the index finger will rest on the milled edge of the disc, and by flexing the finger the disc will be rotated.

The makers are prepared to supply the instrument with either of two sets of lenses :—

1. Discs filled with half dioptres, 0·5 to 3D., flaps with 3 and 6D., so that every half dioptre can be obtained up to 9D., plus and minus.

2. Discs filled with whole dioptres, 1 to 6D., flaps with 0·5 and 6D., so that half dioptres up to 7D., and whole dioptres up to 12D., plus and minus, can be obtained.

The maker is Mr. W. Dixey, of 14, Wigmore Street, and 552, Oxford Street, London, W. The workmanship is excellent, and the cost moderate.

REVIEW.

DETACHMENT OF THE RETINA REVIEWED.

BY

ERNEST THOMSON, M.D.

SURGEON TO THE GLASGOW EYE INFIRMARY, &c.

PART I.

(*concluded*).

THE CAUSES OF RETINAL DETACHMENT.

As already indicated, it seems hopeless to attempt a proper classification of the numerous and varied causes of this affection. Under the above general heading will be grouped all the circumstances under which, so far as my reading goes, it has been known to occur, with the exception of detachment following penetrating wounds of the eyeball.

LOCAL CONDITIONS.

Myopia.

The nature of the causal connection between myopia and detachment is one of the points about which, as we have seen, opinions differ very greatly.

One may say that "simple," "spontaneous," or "idiopathic" detachment is almost equivalent to "myopic" detachment; not quite, however, since detachment for which no determining cause is obvious, may occur in emmetropia and in hypermetropia. Galezowski[1] out of 1,158 cases of detachment had 918 myopes, the balance emmetropes and hypermetropes. Horstmann[2] states that myopia is the cause in most cases where the detachment becomes total. According to Galezowski[3] the *degree* of myopia is of less consequence than the *fact* of myopia, and it is not myopia alone, but myopia with trauma that is the direct cause of detachment. Detachment by no means always follows the trauma immediately. It may come on long afterwards, and there may be no relation between the intensity of the trauma and the amount of intra-ocular change. These observations by a man of immense experience are of the greatest importance at the present time, as we shall see later, in connection with medico-legal aspects of detachment; but, apart from medico-legal aspects, Galezowski's ideas are of great interest, namely, that in myopes any contusion or blow on the eyebrow or temple, or on the eyeball itself, should be considered as a danger to the future of the eye; that a strong movement of the eye, a shock to the body, a fall on the head, coughing, or vomiting are sometimes sufficient causes; that it may occur after tooth extraction, and even as the result of emotions such as wrath or fear.

So also Schirmer[6] in 1871, reported that in a hysterical girl with slight "sclerectasia posterior" unilateral detachment occurred as the result of convulsions during chloroform anæsthesia.

Argyll Robertson's[7] case, reported in 1867, possibly belongs to the same category. A boy of seven years was seized with bilateral sudden dimness of vision from retinal detachment after high swinging in the playground.

Whether Knapp's case[8] is of the same nature or not seems doubtful. A myope, not addicted to drink, took a large glass of whisky. Immediately thereafter the sight of the left eye became very defective; this was found to be due to detachment. An interesting point is that on previous occasions after taking whisky for diarrhœa the patient had seen flashes of light and sparks for hours afterwards, but never previously had there been permanent defect of vision.

Since coughing has been shown by Brailey[9], Webster[10] and Teillais[11], to produce detachment without special reference to myopia, it is fairly obvious that in myopia coughing must be a possible cause. Teillais' patient was a child of four years, who developed double detachment during severe whooping cough: the detachment was probably due to hæmorrhage.

Cofler[12] accounted for the great prevalence of detachment in Dalmatia by the roughness of the mountain roads over which people travel on horseback, without stirrups. My notes, however, do not indicate that Cofler makes special mention of myopia.

As indicating, in a general way, the effect of bodily strain as a cause, we have Ohlemann's case[13] of an emmetrope of 60 years, who suffered a sudden detachment after carrying ten or twelve sacks of corn weighing 60 to 65 kilogrammes each; Fromaget's case[14] of detachment after playing football; and the interesting and fully reported case by Hann and Knaggs[15] of double detachment during labour, in a woman who, while she had albuminuria, did not have albuminuric retinitis. In all these cases we probably have the influence of retardation of the flow of venous blood from the eye throwing a strain, as Hann and Knaggs suggest for their case, upon the choroidal capillary circulation. It seems quite reasonable to suppose that such back pressure might either produce actual hæmorrhage or subretinal effusion, and

equally reasonable to suppose that if the eyes are myopic the tendency to vascular stasis will be more than usually dangerous.

Congenital Detachment

Congenital detachment has been reported by Fernandez[4] in two out of five children in one family. At first a diagnosis of glioma was made at the age of a few weeks, but eventually it was possible to diagnose bilateral total complete detachment.

Sulzer[5] saw a double detachment in a child of 12 years, which he was unable to explain, and which may therefore have been congenital.

The case reported much earlier (1886) by Maher[66] and quoted later on, may, after all, not have been due to birth injury as reported. It may have been congenital.

Detachment Associated with Disease of Neighbouring Regions.

Metaxas[16] stated that he had three times seen detachment follow facial erysipelas. Von Graefe[17] and Berlin[18] each reported a case of detachment occurring during the course of orbital abscess. In the former the swelling was transparent and circumscribed, and was attributed to compression of choroidal veins; in the latter it is described as subretinal œdema. In both, the conditions disappeared with the cure of the orbital disease.

Brockaert[19] observed vitreous opacities and retinal detachment in a woman, aged 62, who for long had suffered from ethmoido-frontal sinusitis. He considered these alterations to result from localized infective choroiditis. Nasal treatment caused clearing of the media, though the detachment remained.

Fish[20] has fully recorded a case of frontal sinusitis which was intimately associated with detachment of the retina; the latter had disappeared three days after canalization of the sinus through the nose. The detachment was grey, prominent 4 D, and situated in the lower part of the fundus. Vision was $\frac{1}{10}$. On the day after operation it was $\frac{15}{30}$, and three days later, the fundus being normal, was $\frac{15}{15}$.

Fish refers to the fact that twelve years previously Ziem[21] had observed contraction of the visual field following nasal affections and sinusitis. He believes that all these phenomena, and also orbital and periorbital œdema observed in the course of sinusitis, are caused by passive hyperæmia produced by engorgement of the orbital veins. It is true (Kuhnt, Celliez) that often an iridocyclitis plays the part of intermediary between the nasal affection and the subretinal exudate.

I may perhaps be allowed to find room here for the curious case reported by Ulrich[22], in which a retro-ocular hæmorrhage is stated to have pushed in the posterior pole of the eye in such a way as to simulate a detachment.

"Trophic" Disturbance.

Bellencontre[24] in 1901, reported a case of exophthalmic goitre in a woman who was not myopic, who was not syphilitic, albuminuric or diabetic, and who had suffered no trauma. Her right cervical sympathetic was divided, and in

the same year she developed right polar cataract, and detachment of the right retina which became total. It is suggested by Bellencontre that certain unexplained detachments may follow functional or organic disorders of the "trophic centres."

This case seems to me very suggestive of a direct vascular causation of detachment.

Lesions of the Uveal Tract.

It is obvious that a large share in the causation of detachment belongs to lesions of the uveal tract of one kind or another, whether such lesions be acute or chronic inflammations, vascular stasis, hæmorrhage; whether they be local or systemic in origin; whether the vitreous be affected primarily, secondarily, or not at all. No matter what theory one may adopt as to the pathological anatomy of a given case it is hardly possible to get away from the idea that usually, at least, the nutrient coat of the eye must have a share in the process. This was, indeed, assumed when, in pre-ophthalmoscopic days, the disease was called "hydrops-choroideæ."[25] The Leber-Nordenson theory of vitreous retraction may have thrown the exudative theory somewhat into the back-ground, but we must not forget that if the vitreous is diseased it owes that to the uveal tract. It would be tedious to take up individual cases of uveal tract disease in association with detachment; we shall find, however, that most of the general diseases which are accredited causes of detachment, act by setting up changes in the nutritive coat of the eye. We have already seen that there is evidence of a direct influence of choroidal circulatory disturbance on the retina, tending to its detachment.

SYSTEMIC DISEASES.

Cardiac disease and detachment.

Reference has been made to local vascular conditions as possibly causative. This is a convenient point, therefore, at which to notice a theory advanced by Louis Dor[23], in 1901, as to the influence of certain cardiac lesions in producing detachment other than myopic (or presumably "simple" detachment, whether myopic or not: E.T.) Dor supposes that when detachment occurs in such diseases as syphilis and nephritis it is due to a cardiac lesion, generally mitral stenosis. He thinks there is a relation between soft eyes and mitral stenosis. His idea is that the cardiac disease induces a fall of pressure in the "ciliary gland" which results in a diminution of aqueous and vitreous pressure, and induces, on the other hand, an increase of pressure in the vasa vorticosa. The retina, held between two unequal pressures, will detach just as it does when an eye, held between the fingers, is opened with a razor, *i.e.*, just when the intra-ocular pressure becomes *nil*. The same thing may happen with retinal detachment following operative escape of vitreous. Dor suggests that the dorsal decubitus really cures detachment—when there is a cure—through the medium of the circulation, and not merely by the action of gravity on the retina itself.

Dor's idea has not, perhaps, received the amount of attention which it deserves, and, so far as my knowledge is concerned, the relation said to exist between soft eyes and mitral stenosis has neither been confirmed nor disproved.

Nephritis.

That albuminuria might be a cause of retinal detachment seems to have been known to Sichel[26] about 1860. Dickinson[27], in his treatise on diseases

of the kidney, mentions the case of a child of 11 years, who suffered detachment of both retinæ as the result of granular kidney and albuminuric retinitis. Davidson[28] reported a quite similar case in a girl of 14 years, Anderson[29] in a girl of 9 years, and Sawyer[33] in a child of 11 years. All four young patients died. Simon[35] saw a case of cyclic albuminuria, where the choroid was detached from the sclera, and the retina from the choroid by an albuminous exudate. Detachment of one retina in Bright's disease has been reported also by Lane[31], W. J. Collins[32] and Hirschberg[72]. In Collins' case the detachment occupied the site of the fovea and an area twice its dimensions around it. Hogg[73] observed albuminuric retinitis and uræmic blindness followed by detachment. The retina eventually became re-attached. Raehlmann[30], in the course of argument for the diffusion theory, states that detachment occurs more frequently in individuals disposed to œdema than in the healthy, and cites the instance of nephritis where there is œdema of other organs, and *often double detachment.* Double detachment in nephritis appears to have been well known to Raehlmann.

The pathological anatomy has been worked out by Madame Gourfein-Welt[34] who states that anatomical examination has already been made in six cases of detachment in albuminuric retinitis, and that to these she is able to add two more. The pathological changes in the retina and choroid were not very dissimilar from those found in albuminuric retinitis without detachment. The vitreous was thickened and retracted, but Madame Gourfein-Welt considers this as consecutive to and not accounting for the detachment. Cases have been reported by Uhthoff, Kunz, Sammet, Brecht, and Schweigger and Herter, where detachment has appeared with dropsy—general or local—and has disappeared with the subsidence of the dropsy. These facts show the close relationship between general or local œdema on the one hand, and detachment of the retina on the other. The sub-retinal exudation is to be regarded merely as a dropsical effusion behind the retina. With the microscope one may often find in albuminuric retinitis a grumous or reticular exudation lying in front of and behind the retina. This exudation, which is liquid during life, is derived from œdema of the retina. When it is present the retina may be said to lie between two layers of liquid, and this is doubtless a factor predisposing to detachment by secretion poured out by the choroid. Madame Welt's conclusions are :—(1) The subretinal exudate comes from the choroid, and is a dropsical exudate identical with œdema of other organs. (2) The reticulated or grumous exudate which precedes actual detachment is formed from the retina. (3) Detachment may be produced without active traction. Adhesions have not been found between vitreous and retina. (4) Detachment is not due to passive traction, for the retraction of the vitreous body found anatomically is probably later in time than the detachment, and hence cannot be the cause thereof.

In a case of retinal detachment accompanying chronic nephritis, reported with anatomical examination by Uhthoff[69], the detachment became cured after drawing off fluid from the skin. The case came to post-mortem. In some parts the retina was simply re-applied, the rods and cones, though altered, being preserved ; but in other regions the retina was soldered to the choroid by an organised connective tissue exudate. This organised exudate corresponded to the white striæ often seen in cured detachments.

From the facts which have been related, one seems warranted in concluding that detachment in chronic nephritis is an unfavourable symptom, since it seems to occur in the worst cases of the disease.

Nephritis of Pregnancy.

If the prognosis as to life seems bad in regard to chronic nephritis, it is otherwise in nephritis of pregnancy. In 1855, von. Graefe[36] had stated that sight did not return, although a retina became re-attached. In a case of pregnancy albuminuria, a detached retina became re-attached, and recovered its function so far as to cause von Graefe to change his mind. Fano[37], to whose article I have not had access, saw detachment in pregnancy which did not improve after delivery, but I do not know whether there was albuminuria or albuminuric retinitis. Lotz's[38] patient was myopic, pregnant and albuminuric. During pregnancy a large detachment occurred. The pregnancy having been terminated artificially on account of eclampsia, the retina became re-attached, but there was no recovery of function. Prouff[39], in discussing the treatment of detachment, stated that he had twice seen detachment occurring in pregnancy albuminuria recover spontaneously. Another very interesting observation of the same kind is that of Adamük.[75] In reply to Logetschnikow (who had doubted the correctness of the diagnosis of *temporary detachment* in pregnancy albuminuria), Adamük reported a case of binocular, total, funnel-shaped undoubted detachment of the retina, which had developed in a woman, aged 30, in the eighth month of pregnancy during a severe eclamptic attack, $V=\frac{1}{\infty}$. The vision rapidly improved after the induction of premature labour. A few days later only slight detachments in the lower halves of the eyeballs were found; after another few days the detachments had entirely disappeared with $V=\frac{20}{60}$.

Heilbron[40], quoting Silex, says that one in every 3,000 pregnant women, usually primiparæ, and in the second half of pregnancy, suffer from albuminuric retinitis. But cases of retinal detachment are rare; they have been reported by Graefe, Brecht, Schweigger, Herter, and Prouff (references given). The characteristic of these detachments is that they cure spontaneously, leaving in the reattached parts sometimes vascular lesions, sometimes pigment changes. Vision is partly re-established, only rarely perfectly restored without ophthalmoscopic changes. Guende (quoted by Heilbron) saw double detachment in a primipara with albuminuric retinitis. Vision was reduced to p.l., but returned after parturition. In a case of detachment with albuminuric retinitis of pregnancy Greenwood[41] observed re-attachment after delivery, though vision remained bad on account of optic atrophy.

Scherenberg[42] was able to examine the eye after death in a case of albuminuria with retinitis, œdema of retina, detachment of retina, in which premature labour had been induced on account of uræmic symptoms. Microscopic examination showed, apart from retinal changes, a massive exudation between retina and choroid, evidently due to very extensive changes in the vessels of the whole uveal tract. In the choroid, especially, numerous vessels were completely thrombosed. There were no retinal tears and no lesions of the vitreous. Scherenberg says that the case teaches that artificial labour should be induced as early as possible in albuminuric retinitis of pregnancy, even in the absence of general œdema or other alarming symptoms. This, however, opens up a very large field of discussion, which may conveniently be left to the obstetricians.

A question of some importance in connection with nephritis (whether during pregnancy or otherwise), is, "does detachment occur during nephritis apart from retinitis?" There appears to be evidence that it may. Rachlmann[30] (p. 101), implies that in ordinary nephritis detachment may occur simultaneously with œdema of other organs, even in association with

that of the bulbar conjunctiva. This view, that severe retinal detachment may be associated with general œdema without definite signs of retinitis, is strengthened by the case recently reported by Wilson and Hird. In a woman of 25 years, in the eighth month of pregnancy, there was double retinal detachment associated with general œdema and œdema of the eyelids and conjunctivæ. After induction of labour, the œdema gradually disappeared and the vision improved The detachments eventually disappeared entirely, and the visual fields became full, though the visual acuity, corrected with glasses, did not get beyond $\frac{6}{12}$. The fundi were dotted over with pigment spots, the choroid was thinned, and there were some whitish changes in the retinæ. A few white patches obscured the arteries in places.[81]

Diabetes.

Detachment sometimes occurs in diabetes, although I have only two references to it. Max Knies [70] states that Galezowski saw three cases in 144 diabetics. He also says, "a hæmorrhage behind the retina (in diabetes) occasionally leads to its detachment."

Best , in discussing the causation, refers to diabetic detachment as being of exudative origin.

Syphilis.

In Galezowski's 1888 statistics[43] syphilis is given as the cause of detachment 18 times out of 784 cases, and in the 1895 statistics 30 times out of 1158. Gillet de Grandmont[44] emphasises its importance. He looks upon the frequency of vitreous affections in detachment as supporting this, so that mercury and iodide should always be given a fair trial. Changarnier[45] has reported syphilitic double detachment, but I have not had access to the paper. Lang[46] also has seen a double detachment, supposed to be due to syphilis, which recovered under treatment by mercury and rest.

The natural criticism which one feels inclined to make as to syphilis as a cause of complete detachment (as opposed to mere elevation of the retina), is that syphilitic symptoms in general are amenable to treatment, while retinal detachment is the very reverse. On the other hand, doubtless, the bulk of incurable cases are myopic cases, and it might well be that some of those which are due to syphilis are the cases that do become cured with or without treatment

As regards what Landolt and Galezowski have called "soulèvement rétinien," or elevation of the retina, Galezowski[50] says that the milky raising of the infiltrated retina, which occurs near the ora serrata in syphilis, is to be distinguished from ordinary detachment and treated as merely a syphilitic manifestation.

Rheumatism and Gout.

Rheumatism and gout have been blamed with the production of detachment by a number of writers. Galezowski[74], in 1877, puts into his Class I "Cases such as those which occur in acute rheumatism," and he considers that such detachments are caused by effusion of fluid as in the pleura and pericardium. The same author, in his 1895 statistics,[50] states that out of 1,158 cases of detachment, "arthritism" was recognised 732 times. Thus, rheumatism and myopia, he says, play the chief rôle in the causation of detachment. Boucheron[47], in 1884, held that, in addition to the principal predisposing cause

(myopic cyclo- or sclero-choroiditis), the most common causes of primary choroidal exudate are rheumatic or uric acid manifestations in the myope. Chibret and Boucheron, in the discussion on a paper by de Grandmont[48], in which syphilis is named as a cause, respectively added rheumatism and gout, thus giving us the familiar "syphilis, gout and rheumatism" as causes of detachment. Wagenmann[49], in 1897, when discussing gouty eye affections in general, said that he had seen a retinal detachment with severe irido-cyclitis, and the formation of gouty nodules in the sclera follow quickly on an attack of episcleritis.

Exanthemata.

It would be an interesting point if one could establish a relation between the exanthemata and retinal detachment; unfortunately my notes on this subject are extremely meagre and merely suggestive.

In 1886, Snell[51] brought under the notice of the Ophthalmological Society a case in which a detached retina contained cholesterin crystals. Speaking on the case Nettleship said that total detachment at so early an age (the child was aged 11 years, and the detachment probably dated from the age of 2 years) is most unusual. There is, he said, a class of cases where, in children, gross detachment of the retina occurs in connection with thick patches, sometimes white, sometimes yellow, on or behind it, with an appearance as if indicating subretinal hæmorrhage. In one such case (and he thought Mr. Snell's was another) there was a sediment containing fat globules in the sub-retinal space. As to the causation nothing was known, but he suggested a connection between the detachment and an exanthem. The patient whose case he quoted had recently had scarlet fever.

One must not forget the possibility that nephritis after exanthemata might be the cause of detachment.

That detachment may occur in whooping cough seems probable enough since a choroidal hæmorrhage during coughing is at any rate quite intelligible. Teillais' case, already referred to[11], was probably of this nature. Such a complication can only be regarded, one would suppose, as accidental and so to speak traumatic.

Alvarado and Alvarez, in a paper[52] to which I have not had access, consider that the infective origin of detachment of the retina is not so rare as has been thought, and that this factor is of great importance in the ætiology of the disease.

Malaria.

The question whether malaria may be a cause of detachment seems to be a matter of some importance in France since, if it is so, the State becomes responsible for "compensation to its Colonial servants." Terson[53] appears to have been the first to raise the point, and admittedly his cases are merely suggestive. One of his cases of malaria with detachment was emmetropic, but the other was myopic 4D. In the course of the discussion on Terson's paper Sulzer said he had known malarial patients suddenly to present vitreous opacities with much reduction of vision, and p. l. only in a portion of the field. Lagrange remarked that Terson's cases were probably subsequent to infective metastatic choroiditis; with this Terson seemed inclined to agree.

After Terson came Truc[54], who raised in earnest the question of malarial detachment and State responsibility. Truc had only one case, but in it there had been neither trauma nor previous eye disease, and the patient was not

myopic. The patient had suffered from dysentery, tænia and bronchitis, all of which had been cured, but the malarial affection had been very serious. Truc admits want of *proof*, but says that, clinically, malaria cannot be excluded as a cause of detachment.

In 1906, Lèques[55] followed with two cases of severe malarial infection. The patients suffered from detachment which came on immediately after febrile attacks with headache, periorbital neuralgia, hyperæmia conjunctivæ, photophobia, and lacrymation. Both had previously had excellent sight, and none of the ordinary causes of detachment were present. Yvert, who reported the cases from the original into the *Recueil d'Ophtalmologie*, supposed that the actual cause of detachment was subretinal effusion from the choroid.

Relapsing Fever.

About this disease in connection with detachment my notes contain but one reference. Max Knies[70] (p. 385) says "In severe cases (of relapsing fever) the tension of the eye is considerably diminished; shrinking of the vitreous, detachment of the retina and finally phthisis bulbi may ensue."

Tubercle.

That references to tubercle as a cause are very scarce is hardly what one would expect; but I have only two references to it. There must be others of course. Wicherkiewicz[56] (in 1900) reported that he had seen a tuberculous nodule of the choroid cause a very extensive detachment. General treatment cured the detachment and stopped the course of the coincident pulmonary tuberculosis. Louis Dor[76], in 1904, expressed the opinion that certain detachments are dependent on an inflammatory tuberculous process. Out of 64 personal cases 8 were or had been tuberculous.

Pernicious Anæmia.

In a case of pernicious anæmia Leslie Buchanan[77] found numerous retinal changes, among others elevation of the retina by an exudate 0·3 mm. thick. The main constituent of this layer was a fibrinous coagulum entangling granular débris. Buchanan looked upon the exudate as mainly the result of œdema, not of hæmorrhage.

PREGNANCY, etc.

Pregnancy.—That detachment may occur in pregnancy nephritis we have already seen. There is some evidence that it may be found without albuminuria at all. Thus Schoeler[78] in 1867 reported the cases of two sisters, each of whom suffered during pregnancy from retinal detachment without albuminuria or retinitis. A temporary improvement only occurred in one of them. Ramsay[79] says "during pregnancy separation of the retina may occur by itself or may complicate albuminuric retinitis." Galezowski[67] has reported at least two cases of detachment in pregnancy, but in one although renal symptoms were absent myopia existed, and in the other there was myopia while the renal condition was not ascertained.

Labour.—As to detachment in association with childbirth, we have the case reported by Hann and Knaggs,[57] in a woman who, while she had albuminuria, did not have retinitis. She had general œdema, and previous to becoming comatose (after having severe pains for 24 hours) she complained of inability

to see. Labour was terminated by forceps, and for 30 hours no urine was secreted. Two days after labour ophthalmoscopic examination showed very movable detachments in the lower third of each eyeball. A month later examination showed that the detachments had disappeared, except that it was just doubtful whether the right retina was completely attached far forward. The authors give an elaborate explanation to show that the influence of the labour was unmistakable, the long and short of the explanation being back pressure on the choroidal capillaries. "Given the general tendency to œdema dependent upon the renal disease, the mechanical conditions induced by the strain of the labour were probably quite sufficient to account for the detachments." But the case seems open to the explanation that the detachment was rather due to the renal condition than to the labour. Galezowski [67] gives accounts of two cases said to have come on during labour, but neither of these are sufficiently conclusive to warrant further quotation.

Menstruation and Menopause.—A case of detachment following so-called preclimacteric hæmorrhages from the genital organs has been reported recently by Ziegenspeck[58]. The detachment was central and due to subretinal bleeding. In 1877, Fano[68] saw double detachment due to menstrual suppression. I do not know the details, and it is the only case in my notes.

TRAUMA.

The word *trauma* literally means a wound, and the general meaning attached to the adjective *traumatic* implies an injury by cutting or stabbing, or by bruising. The meaning may, however, be extended to cover any injury or damage.

To examine adequately the literature of traumatic detachment is out of the question, but my notes contain some cases which seem to be of special interest. I shall quote a few of them here, but I must devote some space later on to those cases which, since the passing of the Workman's Compensation Acts, have become acutely interesting from the medico-legal standpoint; cases, I mean, of late onset of detachment after trauma.

It is worth noting that Galezowski's 1888 statistics[43], give trauma as the provoking cause of detachment, 194 times out of 784.

Direct Concussion.

A boy of 15 years received a stroke with a whip on the left eye. Logetschnikow[64] found hyphæma, iridodialysis, hypotonus, slight diffuse vitreous opacity, and detachment of the retina. Nine days later, under rest and atropin, the detachment had disappeared, vision was $\frac{7}{8}$ and V.F. full.

Oddly enough, the next case is that of detachment through a blow on the eye with a horse's tail, reported by de Schweinitz[65]. The vision was reduced to hand movements in a small part of the field of vision. Yet forty-eight hours later (after rest in bed) the retina was reattached, and the field of vision was normal for white, blue and red.

Rupture of the Choroid.

Detachment may follow rupture of the choroid. Thus, Saemisch[59] six months after a rupture of the choroid, noticed the onset of detachment. Knaggs[60] reported an unusual case in which two months after rupture of the choroid, by contre-coup from a bullet wound, a curious wedge-shaped retinal detachment appeared. The detachment was found to have disappeared a year later, and at the end of the second year the retina remained attached.

Contre-Coup.

The following cases in which detachment is reported to have followed indirect injury are interesting.—Risley[61] attended a man of 29 years, who gave the history that, when out shooting, a duck gun had been fired just beside his left ear. The ear became immediately deaf and there was violent pain in the left eye. The vision of the left eye was diminished soon after the accident, and became poorer and poorer till at the end of a year sight was abolished. At the end of the second year, Risley found almost complete detachment of the retina and probably of the choroid. He explains the total abolition of vision by supposing a retrobulbar hæmorrhage.

In Ellerhorst's case[62] a stone the size of a walnut fell from a height of one-and-a-half metres on the patient's right eye. It wounded the cornea and dislocated the lens under the conjunctiva in this eye, while in the other eye was found a total retinal detachment with a vertical tear in the macular region; no other injury to this left eye. The author supposes that the detachment was due to shock through the skull walls. In the case mentioned under rupture of the choroid by Knaggs[60] the choroidal injury is supposed to be due to contre-coup. Schmidt[63] reported a case where bullet wound of the brain led to total retinal detachment of one eye, presumably by indirect violence.

Birth Injury.

It is open to question whether Maher's case[66] is due to birth injury or is of congenital origin. In a child of 8 years there was total detachment in one eye; height of detachment from 1·7 mm. to over 4 mm. The lens and vitreous were clear, and there was a red reflex from all parts of the fundus. The author, therefore, excludes cysticercus and neoplasm. Extending across the upper part of the retina there was a thin band of organized lymph. Labour had been difficult and instrumental; the child could have received no other injury, according to the mother's statement. From these facts Maher is inclined to suppose that the detachment was due to birth injury. At the time he wrote congenital detachment does not seem to have been reported.

Lightning Stroke.

Yarr has reported a case of double detachment from lightning stroke, and Gonin one of choroidal rupture with retinal detachment from the same cause.[80]

Sympathetic Detachment.

Galezowski[67] seems to have been the first to suggest (in 1884) that detachment of the retina might be a sympathetic manifestation. The next reference in my notes to this subject does not occur till 1900, when Wicherkiewicz[56] expressed the opinion that the sympathetic influence of an eye affected with detachment can be found in the sympathising eye in the same morbid form—that is to say, can contribute to a more or less pronounced detachment of the retina. I have not seen the original of this article, but from the abstract it seems certain that traumatic detachment is referred to. In the discussion Wramsztyk remarked that he could not admit for the wounded eye any influence other than that of cyclitis, causing detachment in the sympathiser, an opinion which appeals to the reader as probably correct.

Detachment in association with Intraocular Tumour.

The interest of this subject centres mainly round the question of diagnosis, and therefore its discussion will be taken up under that heading.

With exception of the association of detachment with intra-ocular tumour, we have now come to the end of the ætiology proper. But there are still a few points which may be taken up in connection with ætiology.

The Site of the Detachment.

When von Graefe first became clinically acquainted with detachment he supposed that it commenced in the lower part of the fundus. But he was not long in discovering that many, and perhaps most, cases begin in other regions and that by gravitation the fluid eventually settled to the lower part. While it is true that, in the great majority of cases, an inferior position is taken up by the fluid, it is equally true that there are exceptions in which the detachment remains permanently in some other position. The cases which have been recorded have, so far as I have found, been cases of detachment at the posterior pole of the eye. Lang[1] had a case in which the patient struck her own eye with her hand. There was no history of any eye disease or of any other injury. In the yellow spot region there was a detachment. Millikin[2] saw a patient, aged 80 years, in whom a macular detachment had occurred, supposed to be due to a current of cold air on the face. We have seen that there is at least a probability that vasomotor disturbance may cause detachment, but this idea certainly seems to require a grain of salt for its digestion. Vennemann's[3] case not only illustrates the possibility of traumatic macular detachment, but also shows that in course of time it may be impossible to diagnose retrospectively, owing to the appearances being equally explainable by several hypotheses.

E. von Hippel[4], in his paper on pathologico-anatomical findings in the eye of the new-born, describes and figures a limited detachment at the fovea, due to blood from the inner nuclear layer of the retina, and states that Naumoff has described detachments in the new-born due to blood from the choroid. Hippel concludes, with Naumoff, that such changes in the eye of the new-born may lead to amblyopia without ophthalmoscopic findings. Dahrenstadt[5] has reported the case of a boy who fell on his eye and developed a ring-shaped bank-like detachment round the optic disc. W. J. Collins[6] saw a permanent detachment of typical blue-grey rugose appearance which occupied the foveal region, in a woman with chronic nephritis and appearances of albuminuric retinitis in this eye only.

Some Statistics of Incidence, Age, &c.

Figures are fallacious and are apt to be uninteresting. Nevertheless, when statistics from different sources agree in a general way they are of value. I have collated some of the statistics, rejecting those which seemed doubtful or inconsistent, and the results I propose to give very briefly.

(1) *The Incidence of Detachment.*

Horstmann[7]	(1898) 0·80 per cent.	of the total eye patients.
Galezowski[8]	(1895) 0·51 ,,	of 223,000 eye patients.
Hirschberg[9]	(1879) 0·50 ,,	of 22,500 eye patients.
Poncet[10]	(1887) 0·50 ,,	of the total eye patients.
Gabler[11]	(1900) 0·15 ,,	of the 76,402 eye patients at Buda-Pesth.

(2) *Bilateral Detachment* occurs in

Emerson [12]	(1891)	19 per cent.	out of 21 cases.
Horstmann [7]	(1898)	8·4 ,,	,, 106 *spontaneous* cases.
Galezowski [13]	(1888)	7·2 ,,	,, 784 cases.

(3) *The male sex shows the greater percentage of cases.*

All authors agree. The figures vary from 54 per cent. to 67·8 per cent.

(4) *Detachment is rare under 20 years.*

The statistics are unsatisfactory as to other points relative to age.

(5) *Detachment is associated with myopia.*

Galezowski [13]	(1888)	82 per cent. of cases.
Galezowski [8]	(1895)	79·2 ,, ,,
Bull [14]	(1894)	57·8 ,, ,,
Reik [15]	(1896)	50·0 (approximately) per cent. of cases.
Poncet [10]	(1887)	37·0 per cent. Choroiditis 19 per cent., total 56 per cent. of cases.

(6) *Trauma is the cause.*

Bull [14]	(1894)	21 per cent. of cases.
Poncet [10]	(1887)	19 ,, ,,
Galezowski [8]	(1895)	18·6 ,, ,,

One point stands out prominently in the foregoing figures, and that is the disagreement between Galesowski's percentage of myopia and that of the other three authors quoted. There does not seem much room for doubt, taking into consideration one's own experience of detachment in practice in Great Britain, that a figure approximating to that of Galezowski is nearer to the mark than the others.

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OPHTHALMOLOGICAL INSTRUMENTS

MADE BY

E. B. MEYROWITZ,

LONDON, PARIS AND NEW YORK.

(1) By Dr. F. D. Skeel, New York. A new Test Type Holder.
(2) By Dr. G. A. Suffa, Boston. Instruments for Shortening or Tucking Ocular Muscles.
(3) An Electrically Illuminated Needle Holder.
(4) A New Portable Battery.
(5) A New Motor Transformer for Light and Cautery.
(6) New Worth Amblyoscope.
(7) New Instruments in Course of Preparation.

The above instruments are briefly described below—further information will be gladly given upon application, or, by arrangement, they can be obtained upon trial.

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(1) **Test Type Holder.** Dr. Skeel has recently devised a new form of holder which, it is anticipated, will entirely supersede the cube form. Its distinct advantage is that six different types can be exhibited and others can easily be substituted when required. The charts are held in clips and operate as a book—the one in use only being visible. The illumination is by an electric lamp and parabolic reflector suitably mounted on an adjustable arm—detachable if necessary after use. The cost is an important feature when compared with the cube form and although it is not provided with cords to operate at a distance yet when it is considered how often these cords refuse to work easily it is a question if it is a disadvantage. The whole system is an easy one to work with and takes up the minimum of space.

(2) **Muscle Tucking Instruments.** The set of new pattern ocular muscle tucking instruments devised by Dr. Suffa consists of four pieces as follows:—2 retraction hooks muscle clamp, and a myometer, used in the operation for tucking or shortening the recti muscles with a single removable silk suture, also for measuring the amount of muscle tissue so tucked. These instruments hold the muscle exactly where it is placed, avoid torsion, and allows it to remain in its original position until the moment of tying. By their use large errors may be corrected without disturbing the primary tendenous attachment of the muscle. The technique of the operation is fully described in the "Archives of Ophthalmology," May, 1909.

(3) **Illuminated Needle Holder.** This instrument which is of entirely new design, is suitable for either electrolysis (epilation), or for holding eye instruments; and is of particular use for removing foreign bodies. It is fitted with a small electric lamp and condenser, projecting a bright circle of light around the point of the instrument or needle fitted therein. This light allows a surgeon to be independent of outside illumination so that a needle can be used with much greater freedom than if a position had to be found where the holder does not cast a shadow on the object. The lamp is of low voltage, and may be worked with advantage from the small battery described below.

The handle is made entirely of metal, and it can be completely sterilised if desired. The jaws, which hold the needle, open sufficiently wide to take most of the standard small eye instruments, and they will close sufficiently to grip the smallest electrolysis needle.

For epilation an electrode is supplied to complete the electrolytical circuit, and complete directions are provided so that the proper connections can be made.

This is the first complete instrument designed for this purpose and its reception by those surgeons who have seen it has been remarkably good—it can be strongly recommended.

(4) **Portable Battery.** This is a new type of battery specially made up in a convenient form for lighting small surgical lamps used in ophthalmic instruments. Hitherto there has been nothing but a small dry battery, which is never to be relied on unless quite new, deteriorating from the day it is made, and a heavy accumulator which needs frequent charging and attention to keep it in order.

The battery now described is an improved form of Leclanche cell, which does not polarise, and in which the electrolyte is securely contained in such a manner that it cannot possibly spill. It has all the advantages of this form of cell with none of its disadvantages. If kept without the electrolyte, *i.e.* inactive, it will last indefinitely, and it is ready for use directly the electrolyte is added. Currents may be taken from it up to 1 ampere without losing voltage through polarisation. It is of special value to the surgeon requiring a supply of electricity occasionally for lighting a lamp or for cautery—it can be charged in five minutes and quickly emptied. In this condition, as mentioned above, it will keep indefinitely, and be ready for use again immediately upon adding solution. Used in this way it will outlast any of the dry cell batteries usually used. The size of battery made for Ophthalmological purposes is $5\frac{1}{2}$ by $4\frac{1}{2}$ by $1\frac{1}{2}$ inches, and weighs a few ounces; its three cells can be obtained connected in series for lighting, giving $4\frac{1}{2}$ volts. or in parallel for cautery, giving $1\frac{1}{2}$ volts. and the necessary amperage. A small special rheostat can be had for use in conjunction with these batteries.

(5) **Motor Transformer.** In consequence of many enquiries for a small motor transformer for light and cautery work, to take current from direct current mains, the machine now described has been designed and made in England. It consists of a multipolar motor alternator and small stationary transformer. The adoption of this multipolar design has reduced the weight and size to such an extent, that the complete machine and case for same only weigh together 20 lbs. less than half of the usual weight of a machine giving the same output, and the reduction in size has been accompanied by an equal reduction in price. It is controlled by one switch on the high tension side, which acts upon the current given for light and cautery, making either of them strong or weak at will. The current available for cautery is 25 amperes, and for light $1\frac{1}{2}$ amperes, at a pressure of 15 volts. The motor can be fitted to order with an attachment for working surgical drills or massage apparatus. For convenience in carrying, the transformer is fitted in a polished case with carrying strap. The necessary switches and terminals are fitted in an inside lid of the case, while the transformer is quite enclosed in a dust proof, felt lined compartment, which deadens all noise and protects it from dust and dirt. The bearings are self oiling, and carbon brushes are fitted. The machine therefore will run for a great length of time without needing any attention whatever. It is supplied wound for primary voltages of 100 and 200 volts.

(6) **Worth Amblyoscope.** This instrument is the well-known model, the novelty being in the price, namely, one guinea. Previously the cheapest form was nearly double this amount, and in consequence of several surgeons intimating that it was difficult to advise patients to incur this expense, an effort was made to cheapen the construction. This has now been attained, and the new instrument is in every way equal to the previous models. It is supplied complete with a set of the usual diagrams.

(7) **New Instruments.** To be described in the next issue.

(a) An Instrument for Measuring, *objectively*, the interpupilliary distance.

(b) A Luminous Retinoscope dispensing with the usual mirror.

(c) A Luminous Retinoscope on the principle of the Macnab Mirror.

(d) A new form of projection (light) Lamp.

(e) Dr. Rayner Batten's Hydrophthalmoscope.

The "Meyrowitz Bulletin" can be obtained upon application to E. B. Meyrowitz, 1a, Old Bond Street, London.

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CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—OPSONINS IN OPHTHALMOLOGY.

(1) **Pignatari, R.—The theory of opsonins in ophthalmology.** (**La teoria opsonica in rapporto all oftalmologia.**) *Annali di Ottalmologia*, Vol. XXXVIII (1909), fasc. 6-7.

(2) **Knapp, Arnold.—On the occurrence of opsonins in the aqueous humour.** *Archives of Ophthalmology*, July, 1909.

(1) The interesting communication of **Pignatari,** of Florence, ends with the following conclusions:—

zur Nedden's experience* has shown that the opsonins of the blood of man or of animals, non-immunised, is not found in the normal state in the conjunctival secretion or in the avascular tissues of the eye, such as the cornea, aqueous humour, lens, and vitreous. In the various forms of conjunctivitis opsonins pass into the conjunctival secretion, and the more intense the inflammation the more copious do they become. The lacrymal secretion and the discharge from chronic dacryocystitis never contain opsonins.

After paracentesis of the anterior chamber, opsonins may be found in considerable quantity in the corneal tissue, the seat of a pathological process. Thus, it is possible to prove their existence after the performance of keratotomy in ulcus serpens. In the normal eye, paracentesis causes traces of opsonins to appear, although for a few hours only, in the re-secreted aqueous humour.

As after the subconjunctival injection of a concentrated solution of sodium chloride so after inflammatory processes of the cornea, the passage of opsonins into the anterior chamber may be proved. On the contrary, blood stasis is without effect.

In the normal state, the opsonins of blood pass into the vitreous body after repeated punctures of that body, and disappear in several hours. Intra-vitreous inflammations favour the passage of the opsonic substances, while

* For abstract see THE OPHTHALMOSCOPE, March, 1909, p. 178.

inflammations of the anterior segment of the eyeball do not augment the opsonic value of the vitreous body. From this point of view, subconjunctival injections of the chloride are equally inactive. As regards the lens, even the presence of virulent inflammations in the surrounding parts fails to provoke the presence of opsonins.

In order to demonstrate phagocytosis, the leucocytes of gonorrhœal conjunctivitis are especially useful, but the leucocytes from purulent dacryocystitis or of pus from the vitreous body or from an ulcer of the cornea are usually too much degenerated to have the power of englobing microbes.

For these researches, according to zur Nedden, it is important to procure active leucocytes. Washing and centrifugation of the peritoneal exudation should last for a few minutes only, so that the leucocytes may not be damaged. Moreover, all the liquid elements of the exudation must be eliminated. The virulence of the microbes plays also an important part, inasmuch as the more pronounced the virulence the greater is the resistance to phagocytosis. Lastly, account must be taken of the individual properties of each micro-organism *vis-à-vis* the opsonins. For example, the diplobacillus of Morax-Axenfeld yields very readily to the action of the leucocytes; so much so that with the simple physiological solution of sodium chloride a considerable phagocytosis may be determined. For other species of microbe—*e.g.*, the pneumococcus and the streptococcus —zur Nedden has sometimes obtained very positive results, giving evidence of the opsonic action at the end of a quarter of an hour, while at other times phagocytosis was visible only at the end an hour and a half. By conducting methodical experiments, we may convince ourselves that the passage of opsonins into the conjunctival secretion, as well as into the avascular tissues of the eye, occurs in accordance with well-determined laws. It is of undoubted importance in the natural cure of the infective processes of the eyes. A. ANTONELLI.

(2) The experiments made by **Arnold Knapp**, of New York, show that phagocytosis is (1) less in salt solution than in normal aqueous, (2) more marked in immunised aqueous, and is then about equal to that found in normal serum, and (3) still more marked in the second normal aqueous, although most pronounced in the immunised blood-serum. ROSA FORD.

II.—THE LACRYMAL GLAND.

(1) **Constentin.—Traumatic hernia of the lacrymal gland. (Hernie traumatique de la glande lacrymale.)** *Archives d'Ophtalmologie*, avril, 1908.

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(3) **Schirmer, O.—The innervation of the lacrymal glands. (Zur Innervation der Tränendrüse.)** *Bericht der Ophthalmologischen Gesellsch. Heidelberg*, 1908 (Volume published in 1909, p. 1).

(4) **Weekers, L.—Contribution to the pathological anatomy and pathogeny of cysts of the palpebral lacrymal gland. (Contribution à l'anatomo-pathologie et à la pathogénie des kystes de la gland lacrymale palpébrale.)** *Archives d Ophtalmologie*, avril, 1909.

(1) A child of fourteen months wounded one eye by running against a hook, and when seen three days after the accident by **Constentin,** of Geneva, presented a prolapse of the lacrymal gland between the lids of the wounded eye. It took the form of a small, rounded swelling, continued by means of a pedicle through a hole in the superior *cul-de-sac*, beneath the upper eyelid. The prolapse was replaced in the lacrymal fossa, and the wound in the *cul-de-sac* closed by catgut sutures. Result excellent when child was seen $3\frac{1}{2}$ months after operation. SYDNEY STEPHENSON.

(2) **Weigelin,** of Tübingen, was consulted by a man, 59 years of age, on account of a moderate swelling near the right upper orbital margin, which caused slight exophthalmos ; on pressure, the tumour receded into the orbit. It was excised and found to be enclosed in a capsule. It had the size of a plum, a firm consistency, and a lobular structure. The microscopical findings consisted in a fibrous capsule, remnants of intact lacrymal gland tissue, branching columns of epithelial tumour-cells, and cartilage of the elastic variety. Of the tumour cells it was impossible to state whether they originated in connective tissue or epithelium, just as tumours of the parotid gland frequently give rise to doubt as to their sarcomatous or carcinomatous nature. But considering the presence of cartilage and the absence of any manifest transition of gland-cells into tumour cells, the author gives his decision in favour of chondro-sarcoma of the lacrymal gland. C. MARKUS.

(3) The lacrymal gland has a supply from the trigeminal nerve ; these secretory fibres pass into the facial and remain for the greater part of their course. They most probably join, not the nucleus of the seventh nerve, but that of the glossopharyngeal. **Schirmer,** of Strassburg, has, by examining cases of sympathetic paralysis, and cases where the superior cervical ganglion has been removed for glaucoma, tried to decide the question whether the lacrymal gland is analogous to the salivary glands in possessing a double nerve supply. The experiments are somewhat contradictory, and do not to us seem quite convincing, but Schirmer thinks that he has proved that the lacrymal gland has a sympathetic supply which influences secretion directly and not indirectly through the circulation. T. HARRISON BUTLER.

(4) **Weekers,** of Liège, thinks that dacryops may be due to an ascending infection, starting from the conjunctiva, and leading in two different ways to the cystic transformation of an excretory canal of the lacrymal gland : (1) by peri-canalicular sclerosis, the conjunctival orifice of the excretory canal may be obliterated, and in that way a cyst may be formed : (2) by proliferation of the epithelium of the excretory ducts, as well as the primary canals and their ramifications, the canal may be obliterated at its conjunctival orifice, and a cyst may thereby be produced.

In the case reported by Weekers, a lad of eight years had presented for three months, without known cause, a small tumour at the outer commissure of the lids of one eye. It took the form of a somewhat flattened triangular pyramid, the summit of which was directed towards the commissure. It had the size of a small nut, and lay beneath the conjunctiva, to which it was adherent. It was translucent, and fluctuation could be made out. The little growth was ablated, and examined microscopically. It was formed of a large cyst, into the cavity of which opened a number of smaller and less important cysts. Its walls were made up of fibrous tissue, containing glandular lobules and embryonal cells, and lined by stratified epithelium. This epithelium, which was made up of from two to seven or more layers of superimposed cells, was altogether different from the cylindrical epithelium which lines the normal excretory duct. The cavity of the cyst was more or less filled by a finely granular coagulum, in which altered cellular elements

could be recognised. The lacrymal gland and its excretory ducts had undergone profound alterations. The last-named were considerably dilated, and their epithelium had become changed in places from cylindrical cells to stratified ones, while the first-named showed proliferation of the glandular epithelium, the protoplasm of which was granular, The peri-canalicular tissue was infiltrated and thickened. SYDNEY STEPHENSON.

III.—THE BACTERIOLOGY OF THE FEMALE GENITO-URINARY TRACT.

Gurd, Fraser B.—A contribution to the bacteriology of the female genital tract with special reference to the detection of the gonococcus. *Journal of Medical Research*, May, 1908.

The bacteriology of the female genito-urinary tract is a matter of some interest to ophthalmic surgeons, since it has an important practical bearing upon the causation of inflamed eyes in babies An account of the investigations carried out by **Gurd**, of Montreal, may therefore be of interest to readers of THE OPHTHALMOSCOPE.

The diversity of opinion that centres around the existence of pathogenic micro-organisms in the female genital tract appears to be due to various and often to inadequate methods of examination. Take, for instance, by far the most important of all these organisms, namely, the gonococcus. It is claimed by many authors that its diagnosis can be readily made by the microscopical examination of stained films from fresh pus. On the other hand, it is stated by equally good authorities that it is only by means of a most elaborate bacteriological *technique* that the gonococcus can be differentiated in cultures from other organisms resembling it in morphology.

Gurd has examined both smears from the fresh discharge, and has also made cultures. Although he made no special effort to obtain the vaginal or other secretion in an absolutely uncontaminated state, yet he insists upon the necessity of rubbing the cotton swab employed by him over the surface of the vaginal mucosa, in order that cells, which include viable micro-organisms, shall be obtained. Certain sites, as the vagina, the cervix, and the urethra, were examined comparatively, with the idea of finding out which was the most suitable for purposes of practical diagnosis.* The material was planted directly upon the surface of blood-agar, which proved, in the author's hands, to be the best medium for the purpose. It is interesting to note that if the material were inoculated within six hours of its being obtained, a good result could, as a rule, be obtained. Gram's method of differentiation (methyl violet being substituted for gentian violet), with saffranine as a counter-stain, was employed. The author regards any stain other than Gram as of no value whatever in the recognition of the gonococcus. It is to be noted that the typical bacteriological appearance found in pus from an acute gonococcal inflammation of the conjunctiva, is rarely seen in vaginal discharges, although now and then pus from the urethra or the cervix may yield the picture, as may also cases of vulvo-vaginitis in children,

Gurd is of opinion that the direct examination of smears from the vaginal secretion is usually of little value in detection of the gonococcus, and for this

* Gurd finds, as a rule, that the vaginal discharge is the most favourable for bacteriological examination. But when the urethra, cervix, uterus, etc., is apparently the site of the infective process, examination of the particular organ implicated will usually give better results.

there are three main reasons: 1. Some of the many contaminating organisms resemble the gonococcus; 2. The micrococcus catarrhalis cannot be differentiated morphologically from the gonococcus; and 3, the gonococcus is usually present in scanty numbers.

Gurd believes that the importance of the *gonococcus* as a factor in pelvic disease, and especially in puerperal fever, has been greatly under-estimated. He finds that it is present in at least fifty per cent. of the women attending gynecological clinics. As regards his present investigation, the gonococcus was cultivated from the vaginal discharge in 52 (or 55 per cent.) of 93 women suffering from pelvic inflammatory disease. In 72 cases, which were probably gonorrhœal, the organism was isolated in 52 (or more than 72 per cent.). Nineteen women presenting themselves for treatment in either the out-door department or the wards at the Montreal General Hospital were examined bacteriologically, and the gonococcus was isolated eleven times. The women forming this series were by no means all prostitutes, but may be taken to represent more or less fairly the important part played by the gonococcus in female pelvic diseases. The lesions produced by the gonococcus may become extremely chronic, and viable organisms may be found years after any history of active disease can be elicited. The occurrence of pregnancy and labour is often sufficient, the author remarks, to induce an active pathogenic development upon the part of these apparently non-virulent and dormant micro-organisms. The gonococcus is frequently a factor predisposing to a more serious infection, such as that of the streptococcus.

Gurd lays stress upon the comparative frequency with which the *pneumococcus* occurs in the female genital tract, more particularly in acute inflammatory conditions. Thus, in the examination of 113 women it was found in five cases (two acute and three subacute). The vaginal discharge from two patients mentioned in the course of the present communication showed pneumococci, and gonococci were absent, although clinically the cases resembled gonorrhœa. This observation becomes of particular interest when we recall the fact that no inconsiderable proportion of cases of ophthalmia neonatorum (estimated by the reviewer at 10·53 per cent) are associated with the micro-organism in question.

The *bacillus coli* was found in eighteen of the 113 women, and in three of these cases the symptoms were acute, in two subacute, in nine chronic, while in four they were negative. The *streptococcus* was identified on five occasions. The *micrococcus catarrhalis* was found four times, and on two of these occasions it was probably associated with the gonococcus. *Pyococci* of various kinds (albus, epidermidis albus, aureus, rosacea, citreus, etc.,) were present in every case examined bacteriologically. *Döderlein's bacillus* was found in eight cases.

In addition to well-recognized pathogenic bacteria, Gurd found the following microbes to be common in the genital tract of women.—1. A non-motile, Gram-negative diplobacillus, occurring in pairs with the broad ends approximated. It grows well on blood-agar in the form of very fine, raised, transparent colonies, not measuring more than 0·5 mm. in diameter. On glycerine-agar it grows scantily, and not at all on plain agar or beef-serum. As regards laboratory animals, it is non-pathogenic. This organism, which is called by the author the "diplobacillus vaginæ," resembles the gonococcus very closely as regards its size, arrangement, and staining reactions. It was present in most of the conditions examined. 2. An extremely small Gram-negative bacillus, which will grow only upon blood-agar

slightly acid to phenolphthalein. It resembles the B. influenzæ. The organism is termed "influenzoid" by Gurd. 3. A small Gram-positive organism resembling the B. xerosis. It grows well on ordinary media, is non-motile, and produces no change in litmus-milk. It is not pathogenic to guinea-pigs. 4. A Gram-negative bacillus, the peculiarity of which is that it gives rise to fœtor. It grows luxuriantly upon all media. It is non-motile. It liquifies beef-serum; and, finally, it produces gas in semi-solid dextrose medium.

Gurd comments upon the little inconvenience caused to the woman by a moderately acute vaginitis. The fact is of importance when attempting to get a history of a primary acute infection. Most women state, Gurd believes in good faith, that they have no recollection of such a condition.

SYDNEY STEPHENSON.

IV.—CATARACT ACQUIRED IN CHILDHOOD.

(1) **Hansell, Howard F.—Acquired cataract in childhood. Report of a case.** *Trans. Amer. Ophthalmological Society*, Vol. XI, Part 2, p. 436.

(2) **Hansell, Howard F.—The subsequent history of a case of acquired cataract in childhood.** *Monthly Cyclopœdia of Practical Medicine*, February, 1908.

(3) **Harman, N. Bishop.—An unusually rapid development of complete cataract in a boy.** *Trans. Ophthal. Society U.K.*, Vol. XXIX, Fasc. 2, p. 109, 1909.

Cataract acquired in childhood must be an exceedingly rare condition. Two such cases, however, are reported by Hansell, of Philadelphia, and one by Harman, of London.

(1) A healthy lad, aged three years, was brought to **Hansell,** who found that the left lens had every appearance of mature senile cataract, while the right lens showed some signs of opacification. The father of the patient stated that he had noticed some months earlier a difference in the blackness of the pupils, and that the left pupil had gradually turned of a white colour. He had often tested the vision of the left eye, and had found it to be slowly growing duller, until it was finally reduced to the perception of light. He knew of no cause. The history, family and personal, was negative. The child appeared to enjoy perfect health and had always done so. In particular, he had never suffered from convulsions. Externally, the eyes showed neither cicatrices nor signs of inflammation, present or past. The light projection, as tested by two candle-flames, was acute.

In a second communication (2) Hansell gives the subsequent history of this patient. For the removal of the cataract, three discissions were followed by extraction of the opaque and thickened capsule. For several days after the last operation there was a small hernia of the vitreous. This disappeared in a week, and with a *plus* 10 D. lens, sight is said to have been "good," although accurate estimation was obviously impracticable on account of the youth of the child. At the same time he could recognise coins and other small objects. Three weeks later there was partial loss of vision in the eye that had been operated on. This was found, upon examination, to be due to the infiltration of the anterior layers of the vitreous and possibly to detachment of the retina as well. These untoward symptoms,

Hansell thinks, may have resulted from the operations and the subsequent hernia. It is less likely that a blow upon the eye, received the day before the dulness of vision was noticed, was responsible. As to the right eye, the lental opacities—trivial when the patient was first seen—gradually increased in size, the capsule became opaque, and sight was finally reduced to perception of light. Before the lens became wholly opaque, central choroiditis, limited to a small area around the posterior pole, was found. The operations performed upon the right eye included—first, removal of the anterior capsule, and, secondly, linear extraction of the lens. In the result, excellent sight was obtained with cataract glasses. There was no opacity in the pupil; the vitreous was clear, and the fundus was healthy.

The second case recorded by Hansell was observed in a girl of four years, whose eyes were stated to have been healthy until about the third year. Both lenses were ripe. No history of convulsions, diabetes, etc. Hansell thinks that this case might well have originated in a congenital opacity that had escaped the attention of the parents.

(2) **Harman** reports an instance of complete bilateral cataract—"soft, total cataract"—which developed during the course of fifty days in a boy, aged $9\frac{3}{4}$ years when first seen. Pupils active. No keratitis punctata. Projection and perception of light present. No family history of cataract. Measles and scarlet fever at the age of two years. No injury. Lad in good general health, with excellent teeth. The lenses were removed by discission and curette evacuation, with final result equal to 6/6. Examination after operation revealed no abnormality in the posterior chamber or fundus of the eyes. Harman dismisses the possibility of the lad having been the subject of lamellar cataract, which progressed and matured with rapidity, and surmises that some unknown change in the general health may have affected the nutrition of the lens epithelium *per* the blood supply of the ciliary bodies.

SYDNEY STEPHENSON.

V.—THE ABUSE OF ATROPIN IN REFRACTION WORK.

Cruise, R. R.—The abuse of atropin in refraction work. *Transactions Ophthalmological Society U.K.*, Vol. XXIX, 3rd fascic., 1909.

Cruise, of London, having accidentally discovered that he got the same retinoscopy result with homatropin and cocain as with atropin, undertook the comparative examination of 140 eyes in patients under sixteen years, in order to find whether, after all, homatropin and cocain instilled four times in an hour by the surgeon may not be as good as the home-use of atropin. The results were certainly rather surprising, even allowing for the fact that the home-use of atropin is not always satisfactory. Seventy eyes were fully examined and tested, and vision recorded, after the use of homatropin 1 per cent., cocain 2 per cent.; and, again, after the use of atropin thrice daily for three days. Seventy eyes were similarly examined with homatropin 2 per cent., cocain 2 per cent., followed by a similar use of atropin. In Series I, the same result was obtained 52 times, atropin gave greater cycloplegia 14 times, homatropin-cocain a greater cycloplegia 4 times. But in Series II the results were reversed. The same result was obtained 45 times, homatropin-cocain gave a greater cycloplegia 22 times, and atropin a greater cycloplegia 3 times. Only 3 cases showed a difference as great as 1 D.; in one of these the patient was not thoroughly under atropin, and in the other two a

second examination under the stronger homatropin produced equality of results to atropin. The near point was examined in 20 intelligent patients (40 tests), with a +2 D. spherical added to the distance correction in order to bring the near point within measureable distance. In no single case was the near point closer to the eye under homatropin-cocain than under atropin, and it was frequently further away than under atropin. Neither with homatropin-cocain nor atropin did the near point, as measured with a +2 D. spherical added to the distance correction, correspond to its theoretical position.

Thus—R. and L. c. + 4 D. Sph.=6/6
c. + 6 D. Sph.=J.1 at 21 cm., homatropin.
=J.1 at 18 cm., atropin.

Whereas in the absence of accommodation, the near point should be at 50 cm. This error was constant in all the twenty cases in which the near point was investigated. "This suggests," says the author, "either that the additional glass, though placed as close to the eyes as possible, still had a value out of proportion to its focal length in dioptres, or—and this seems the more reasonable—that with neither drug is all the accommodative power lost."

In the discussion, Sydney Stephenson criticised the absence of identical application, the atropin having been used at home, the homatropin-cocain by the surgeon. Marshall's remarks were in the same direction. Harman agreed with Cruise. Ernest Clarke pointed out that the amount of astigmatism had not been mentioned. With low astigmatism in young people spasm existed which was not present in other conditions: homatropin under twenty was not sufficient to cause complete paralysis.

ERNEST THOMSON.

VI.—MYOPIA.

(1) **Fortunati.—A Note on the correction of Mypoia. (Note sulla correzione della miopia.)** *Revista Italiana di Ottalmologia*, December, 1908.

(2) **Kuschel, J.—The development of the higher grades of refraction from congenital hypermetropia by over-stretching of the sclera at the posterior pole of the eye. (Die einheitliche Entwicklung der höheren Refractionszustande des Auges aus der angeborenen Hypermetropia durch Ueberdehnung der Sklera am hinteren Augenpol.)** *Zeitschrift für Augenheilkunde*, Januar, 1909.

(3) **Vergne.—Is there such a thing as school myopia? (Y-a-t-il une myopie d'origine scolaire?)** *Ann. d'Oculistique*, T. CXL, p. 265, avril, 1909.

(4) **Levinsohn, G.—The essential factor in the genesis of myopia. (Das Wesertliche Moment der Entstehung der Kurzsichtigkeit.)** *Bericht der Ophth. Gesells., Heidelberg*, 1908 (volume published in 1909, p. 38).

(1) **Fortunati** has had no success in treating myopia by full correction, and has given this method up. He has had better results from giving glasses with a far-point at working distance and combining them with prisms to suppress both the necessity for accommodation and convergence.

HAROLD GRIMSDALE

(2) **Kuschel** (Ludenscheid.)—The author having completed his series of articles on glaucoma, which were based upon his paper on the architecture of the eye, now uses the same line of argument to explain the origin of myopia. He hints at future papers on the same subject. Hypermetropia is the normal and probably the primitive condition of refraction. Emmetropia results from hypermetropia by a thinning and stretching of the sclera at the posterior pole. This process, which we gather from the paper to be a morbid one, may continue, and lead to myopia in all its grades. T. HARRISON BUTLER.

(3) **Vergne** considers that there is no proof of any causal relationship between school-life and the development of myopia between the ages of 6 and 25 years. He suggests that the parallelism between the two conditions is due to coincidence or is the result of a developmental law, and supports his opinion by the following arguments.—1.—The difference between the percentage of myopia in village schools (5.002) and town schools (6.12) is small. 2.—The French army statistics show no connection between the number of recruits rejected for myopia of 6D. and over, and the standard of education as shown by the number of illiterates. 3.—Those who support the theory of the causation of myopia by school work are unable to agree as to the mechanism by which it is produced. R. J. COULTER.

(4) All theories of myopia postulate an increased intraocular tension whether due to accommodation, to convergence, or to pressure from one or other groups of muscles, an increase which has so far never been demonstrated, although many attempts have been made. Hess and Heine have failed to find any hypertony during accommodation—only where all the muscles become tetanised, as in strychnine poisoning, can any increased pressure be shewn to follow muscular action. Adamuk's experiments only prove that lid pressure can raise the tension. Again, the actual anatomical conditions found in myopia are not those which result from high pressure, which is equally distributed and acts upon the weakest structures, such as the lamina cribrosa. The changes in myopia are entirely different from those in juvenile glaucoma.

There can be no doubt, **Levinsohn** (Berlin) says, although many will not accept this *ex cathedrâ* dictum, that near-work causes myopia. He has shewn or believes that he has, by fixing a Marcy's tampon against the eye, that when the head is bent forwards, the eye is partly proptosed. This is due to congestion of the vessels, and the weight of the eye and of the orbital contents. The globe falls forward and drags upon the optic nerve. The pressure of the orbital fat upon the posterior pole causes trophic changes in the sclera. The result is stretching of the posterior pole. We should combat this tendency by arranging a child's work, so that he is not compelled to bend over his work.

In the discussion that followed the reading of Levinsohn's communication Sattler pointed out that this question had already been investigated by Birch-Hirschfeld (Leipsig), who found that the exit by the facial vein was so free that no congestion could occur in any position of the head. The orbital contents were not so tightly packed that the optic nerve was stretched in the manner suggested. Nor did myopia result in Basedow's disease. Nonne pointed out that high myopia was often monocular, a fact which rather discounts all these theories for its origin. T. HARRISON BUTLER.

VII.—MUSCLES AND DIPLOPIA.

(1) Ohm, J.—On the investigation of diplopia. (Zur Untersuchung des Doppelsehens.) *Centralbl. f. prak. Augenheilk.*, Nov., 1906.

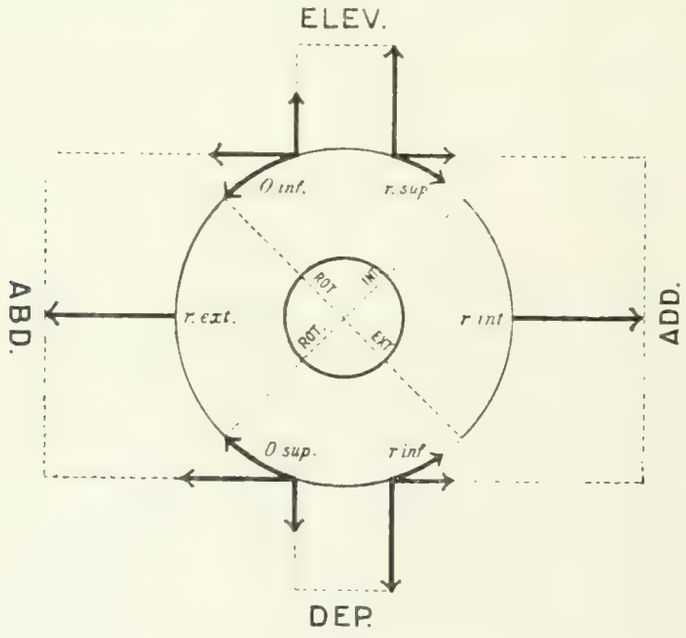
(2) Marquez.—A new didactic schema of the action of the extrinsic ocular muscles. (Un nouveau schema didactique sur l'action des muscles oculaires extrinsiques.) *La Clinique Ophtalmologique*, 10 août, 1907, and *L'Ophtalmologie Provinciale*, T. IV, p. 134, décembre, 1907.

(3) McNab, Angus.—A simple method of diagnosis in paralysis of the extrinsic muscles of the eye. *Lancet*, June 19th, 1909.

(4) Ferguson, R. Bruce.—The prism as an aid to diagnosis in paralytic diplopia. *Lancet*, July 24th, 1909.

(1) **Ohm** describes a new kind of phorometer for the accurate measurement and position of each image in diplopia. He gives drawings and methods of working it. It is in many respects very practical, but any investigation with it would take a very long time. A. LEVY.

(2) **Marquez,** of Madrid, divides the movements resulting from the action of the extrinsic ocular muscles into useful and useless. The former are actually produced, but the latter, although they would result from the isolated action of single muscles, are normally neutralised by useless movements in the opposite direction produced by other muscles acting at the same



time. He gives a diagram founded on the mechanical principle of the resolution of forces, from which it can be seen how the various muscles assist or neutralise each other. He throws doubt on the view generally held that oblique movements are associated with rotation of the eye around its antero-posterior axis (wheel movement) which would in every case be useless as a movement of direction, and considers that in passing from one secondary position to another by a movement of circumduction the eye does not rotate around its antero-posterior axis, but moves around its centre of rotation in such a way that its anterior posterior axis would map out two cones with their apices at the centre of rotation of the eye and their bases respectively at the fovea and the most anterior point of the cornea. R. J. COULTER.

(3) **McNab**, of London, has diminished the difficulty of isolating muscular palsies by eliminating the necessity of taking cognisance of the homonymous or crossed character of the diplopia and of the torisonal displacement. He relies on a method which, as he says, requires no diagram to be memorised, and calls for the minimum of intelligent co-operation on the part of the patient. McNab's reason for dispensing with questions as to the character of the diplopia and of tilting of the image is that both may be misleading; for example, in superior oblique paralysis diplopia should be homonymous, yet if the patient previously had an exophoria the divergence due to it might exceed the convergence due to the paralysis, and the diplopia would be crossed. Again, the patient may state that the coloured candle is tilted and the white candle vertical, no matter which eye has the red glass before it. The method is based upon the following four rules :—

(1) A muscle is paralysed when a diplopia occurs in one part of the field of vision or when there is diplopia over the whole field and the separation of the images increases in one direction.

(2) The direction in which the diplopia is greatest (*i.e.*, greatest angular separation of images) indicates the direction of action of the affected muscle.

(3) The image projected further in the direction of greatest diplopia is formed by the affected eye.

(4) The separation of the images is greatest when the eye is looking along the line of the tendon of the affected muscle.

To the reviewer the first three rules seem self-explanatory and such as are often employed. The fourth rule enables a diagnosis to be made as to the muscle affected in a vertical diplopia without having to consider whether the diplopia is homonymous or crossed, and without having to consider the tilting of the image; and it is in this respect that McNab's method seems to have its principal advantage, because these questions are the most difficult to get properly answered by the patient and the most difficult of interpretation by the surgeon. "Bearing this rule (No. 4) in mind, we have only to recall the direction of the tendons to decide the muscle. We have already determined (*i.e.*, by the other rules) the action of the muscle and the eye which is affected. If the candle be placed in the two positions in which it would be intercepted by the lines of the two possible tendons, then the vertical separation will be greater when it is on the line of the affected one. Suppose that the vertical separation increases downwards and the image from the right eye is lower, we have a depressor of the right eye affected. The line of the one depressor tendon—the superior oblique—passes forward and to the left, and the tendon of the other—the inferior rectus—passes forwards and to the right. The candle is therefore placed in the left lower part of the field, in line with the oblique, and then in the right lower part of the field, in line with the rectus, and the patient is asked in which position is the difference in level greater. His answer will determine the muscle affected." ERNEST THOMSON.

(4) The case observed by **Bruce Ferguson**, of New Southgate, London, N., presented the following peculiarity.—With the red glass in front of the right eye and a light directly in front, the patient saw two images, the false one being down and to his left. The images retained the same relative positions when the light was moved to the patient's left side, but when the light was moved to the patient's right the false image stood down and to the right. The author could not decide whether the paralysis involved the right inferior rectus, or the right superior oblique, and it seemed unlikely that both muscles were affected. It was found that a prism of 6° with its base downwards and outwards corrected the diplopia. As this would be the correction appropriate

to paresis of the superior oblique, the author suggests that we have in the prism correcting a diplopia, a guide to the muscle which is paralysed, the rule being that the paralysed muscle is the one which would rotate the eye in the direction of the base of the correcting prism. The author's case was probably one of those in which paresis of one of the vertical rotators of the eye is superimposed upon a pre-existing heterophoria, with resulting interference with the "typical" position of the false image. A. J. BALLANTYNE.

VIII.—TUBERCULOSIS OF THE CONJUNCTIVA.

(1) **Capolongo, C.—Tuberculosis of the conjunctiva: a clinical, anatomical, and experimental contribution. (Tuberculosi della congiuntiva: contributo clinico, anatomico, e sperimentale.)** *Annali di Ottalmologia*, Vol. XXXV, fasc. 12, p. 933.

(2) **Coppez, H.—A case of lupus of the face, accompanied by tuberculous lesions of the conjunctiva. (Un cas de lupus de la face avec lésions tuberculeuses de la conjonctive.)** *Société Belge d'Ophtalmologie*, 26 avril, 1908.

(3) **Torok, Erwin.—Primary tuberculosis of the conjunctiva.** *American Medicine*, March, 1909.

(4) **Casali, A.—Tuberculosis of the conjunctiva.** *Annali di Ottalmologia*, Vol. XXXVIII (1908), p. 912, and Vol. XXXVIII (1909), p. 3.

(1) The two cases published by **Capolongo,** of Naples, illustrate well the subject of tuberculosis of the conjunctiva, from the clinical, diagnostic, and experimental point of view. The first case was particularly noteworthy. It occurred in a little girl of syphilitic inheritance, and made one think of a gummatous ulceration, but the inoculation of animals led to the correct diagnosis. In the second case the type was rather papillomatous or granulous, instead of being ulcerous. In both cases the involvement of the preauricular, parotid, and sub-maxillary glands was very pronounced. Cure resulted from excision and free cauterisation. A. ANTONELLI.

(2) **H. Coppez,** of Brussels.—This case is of interest since the author followed it for fifteen years. A lupus involving the nose became propagated to the cheek. The right eye was attacked five years after the nose, without there being any direct connection between the lesions of the skin and those of the conjunctiva. The left eye has been affected for three years only. The superior *cul-de-sac* has disappeared. The bulbar conjunctiva is charged with tubercles; the cornea is perforated. The glands are not involved. There is lupus of the gums. H. COPPEZ.

(3) **Torok** (New York City) observed primary tuberculosis of the conjunctiva in a child, aged two years, whose father suffered from tuberculosis, presumably of the lungs. The condition, which had been noticed for five months, was associated with tumefaction of the corresponding preauricular gland. The child's upper lid was swollen and depressed, and its conjunctiva was thickened, hypertrophic, and studded with yellowish-red granules. A piece of excised conjunctiva showed "typical tuberculous tissue." Torok questions the value of the statistics published by Hirschberg, Machej, and Terson, according to which tuberculosis of the conjunctiva is made out to be a rare disease, since as our knowledge of tuberculosis advances, the number of such

cases increases from day to day. Torok states that "the only treatment consists in the use of tuberculin injections," a conclusion from which many practical surgeons will dissent. SYDNEY STEPHENSON.

(4) This thesis by **Casali**, of Florence, constitutes a complete study of tuberculosis of the conjunctiva, accompanied by a personal contribution and an account of experiments upon the conjunctival sac of the rabbit. The bibliography includes no fewer than the names of 280 authors who have written upon the subject. A. ANTONELLI.

IX.—METASTATIC GROWTHS OF THE CHOROID.

(1) **Lafon, Ch.—Metastatic carcinoma of the choroid. (Carcinome métastatique de la Choroid.)** *Recueil d'Ophtalmologie*, mai, 1908.

(2) **Angiolella, D.—Double metastatic adenoma of the choroid.** *La Clinique Ophtalmologique*, 10 mai, 1909.

(3) **Suker, G. F., and Grosvenor, L. N.—Metastatic carcinoma of the choroid.—A critical study with case report.** *Ophthalmology*, Vol. V, July, 1909.

(1) **Lafon** describes a case of metastatic carcinoma of the choroid, a condition of which only 57 instances have been recorded. His patient was a man of 42 years, who developed a carcinoma of the choroid in the right eye, about three months after he had shown symptoms of carcinoma of the right lung. The ocular signs were detachment of the retina at the posterior pole, metamorphopsia, marked diminution of vision, and *minus* tension. Pain was conspicuous by its absence. Four months later, exophthalmos, limitation of the ocular movement, chemosis and congestion of the conjunctiva, and pain on palpation of the eye and of the infra-orbital nerve indicated that the growth had perforated the sclerotic and invaded the orbital tissues. Exenteratio orbitæ was performed, and the growth was found to be an alveolar carcinoma, which showed necrotic areas. The patient died about nine months after the first onset of symptoms.

J. JAMESON EVANS.

(2) **Angiolella's** case of fungating tumour of the eyeball which is diagnosed as metastatic, from a 40 year old tumour of the thyroid, unfortunately is incomplete, owing to the tumour-mass having been improperly fixed and preserved. The patient disappeared, after removal of the eye and its tumour, so that the subsequent history is also unavailable as an aid to retrospective diagnosis. The author adduces various reasons for the faith that is in him, but in the absence of the essential histological facts, these are not conclusive.

ERNEST THOMSON.

(3) **Suker** and **Grosvenor**, of Chicago, take up the story of metastatic carcinoma of the choroid where it was left by Oatman in 1903 (*American Journal of the Medical Sciences*, Vol. CLI), including in their review 27 cases not previously collected, one their own, and bringing the total number of collected cases up to 64. The details of the 64 cases are tabulated and analysed, and the following are some of the conclusions.—Intraocular carcinoma is always secondary to a tumour situated elsewhere in the body. It usually occurs in the choroid, the metastasis being an embolic one by way of the ciliary arteries. The breast is the most frequent seat of the primary growth (39 of the 64 cases). The authors note, with surprise, that the primary

growth was never found in the uterus. The usual age of the patients is between the fourth and fifth decades. In the statistics the female sex predominates, on account of the frequency of breast cancer as the primary tumour. Extra-ocular growths, if they occur, are not due to direct extension but to metastasis by way of the ciliary vessels and nerves. The growth usually stops at the edge of the disc, and the retina is rarely involved. Rapid loss of vision is apt to occur from detachment of the retina. In about one-third of the cases both eyes are involved, but not simultaneously. The second eye is infected by the same pathway as the first. The prognosis as regards life is very grave, the average duration of life after the first recognition of the disease being seven months. Enucleation of the eyeball is indicated only for the relief of pain. In many of these characteristics metastatic carcinoma of the choroid contrasts strongly with intraocular sarcoma. A. J. BALLANTYNE.

X.—SCLERECTOMY WITH THE PUNCH-FORCEPS IN GLAUCOMA.

Holth.—Sclerectomy with the punch-forceps in glaucoma preferably after incision with a keratome. (Sclérectomie avec la pince emporte-pièce dans le glaucome de préférence après incision à la pique.) *Ann. d'Oculistique*, T. CXLII, p. 1, juillet, 1909.

This article is a translation from the Norwegian by Dr. Söderlindh of a communication made to the *Société Française d'Ophtalmologie* on May 5th, 1909, by **S. Holth**, of Christiania, describing an operation which he has employed with success for reducing tension in cases of chronic glaucoma.

In the *Annales d'Oculistique* for May, 1907, Holth published a description of an operation for the relief of glaucoma, which he named iridencleisis antiglaucomatosa*, and gave the results obtained in 40 cases in which he had performed it up to May, 1906. Between that date and May, 1908, he performed the operation 87 times, and obtained a filtering cicatrix with reduction of the tension to less than 25 mm. of mercury 75 times (*i.e.*, in 86 per cent. of the cases), while histological examination of six eyes, after the death of the patients from six months to two years after the performance of the operation, showed in five cases the existence of a very definite fistula, and in the sixth a series of scattered openings which constituted a filtering cicatrix. In no case did increase of tension, infection, or sympathetic inflammation result from the operation. In spite of these good results, Holth was not quite satisfied with his operation, because in twelve of the last series of cases the filtering cicatrix was either absent or insufficient, while in twenty-four others several months elapsed before it was sufficiently developed to assure a normal tension without myotic. He therefore set to work to devise a method which would give more rapidly satisfactory results. First, he tried the following modification of his iridencleisis operation.—A drop of 0·2 per cent. solution of scopolamin was instilled and ten minutes later, the eye having meanwhile been cocainised, a subconjunctival incision was

* Abstracted in THE OPHTHALMOSCOPE, 1907, p. 377.

made with a keratome, and the apex of the resulting iris prolapse was excised. This procedure gave satisfactory results in four cases, but, of course, caused some distortion of the pupil, and so the author has abandoned it in favour of a method which has given him equally good results, while leaving the pupil absolutely round and central.

The iridenclesis operation was founded on the opinion that even in cases operated on by Lagrange's sclerectomy, in which the whole thickness of the sclera had been removed, the resulting gap would ultimately become closed by ordinary cicatricial tissue, and that the good results obtained were due to incarceration in the wound of the periphery of the iris near the edge of the coloboma, similar to that which actually occured in the case examined histologically by Demicheri.* A consideration of Thomson Henderson's† observation that no cicatrisation takes place in the edges of the operative wound in iridectomy led Holth to modify this view. Accepting the explanation that this peculiarity is due to the fact that the wounded surfaces are constantly bathed in the aqueous, and thus protected from the irritative influences which precede all inflammation, he came to the conclusion that the aqueous passing over a fistulous passage might in a similar way prevent cicatricial formation in the edges of a scleral wound. He determined therefore to adopt Lagrange's idea, but in carrying it out, to avoid his large incision, with its attendant risks of escape of the lens or explusive

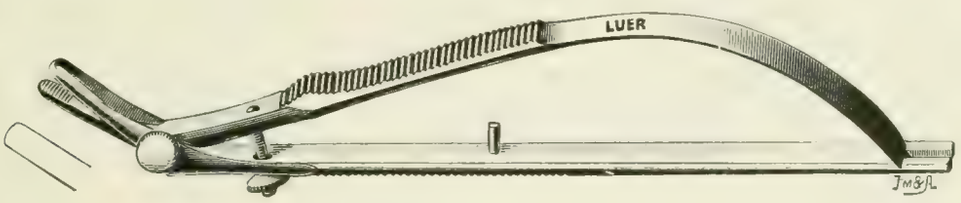


FIG. 1A.—Dr. Vacher's punch-forceps modified by Dr. Holth for sclerectomy.

hæmorrhage, and devised the following operation in which a piece of sclera is removed through a narrow subconjunctival incision by means of a modification of Vacher's or de Lapersonne's irido-capsulectomy punch-forceps (*pince emporte-pièce*) (Figs. 1A & 1B). The blades of these forceps are 2 mm. wide

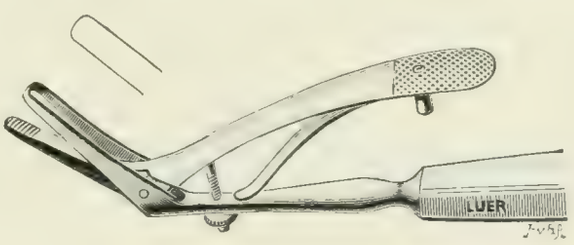


FIG. 1B. Punch-forceps modified for sclerectomy with Professor de Lapersonne's handle.

and have rectangular ends with the angles slightly rounded. The inferior border of the upper blade is very sharp, and the upper face of the lower blade has towards its point several transverse and oblique ridges reaching to its margin, which has thus a saw edge. When closed, the two blades are parallel and slightly crossed.

Ann. d'Oculistique, T. CXL, p. 175. *v.* THE OPHTHALMOSCOPE, June, 1909, p. 438.

†*Ophthalmic Review*, 1907, p. 191.

The instruments used by Holth for his operations are—a speculum, a Holth's elbowed fixation forceps (Fig. 2) a Holth's bent keratome with stop 6 mm.

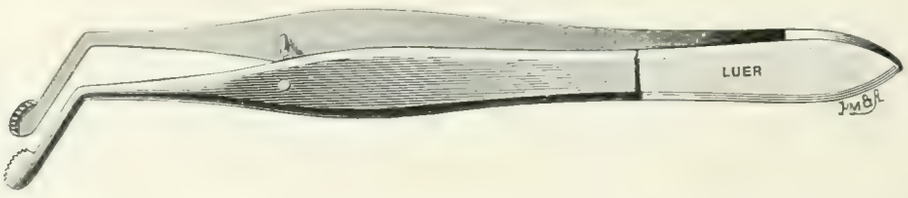


FIG. 2.—Dr. Holth's elbowed fixation forceps useful for fixation of the lower part of the limbus when the eye has to be turned downwards far enough to make the subconjunctival incision above with the keratome (see Fig. 7). An instrument with a catch is used when the patient is under a general anæsthetic.

by 6 mm. (Fig. 3) or a Graefe knife, a Holth's double conjunctival hook

FIG. 3.– Stop keratome bent at an angle of 45°. Dr. Holth's latest pattern with strengthening of the stop in the median plane.

(Fig. 4), a curved forceps with transversely grooved points, a mouse-tooth forceps, a Dowell's forceps scissors with both blades blunt-pointed (or an

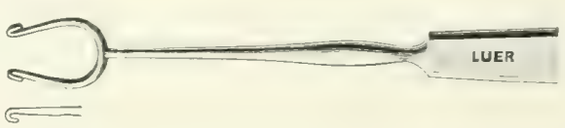


FIG. 4.—Dr. Holth's double blunt hook for turning back the conjunctiva after subconjunctival incision with a keratome.

ordinary curved blunt-pointed scissors) a Holth's punch forceps for sclerectomy (Fig. 1A or 1B) a Holth's curved iris forceps with stop-screw (Fig. 5), a de

FIG. 5.—Iris forceps with stop screw for limiting the separation of the blades to 1·5 mm. when it is desired to make a very small peripheral iridectomy.

Wecker's forceps-scissors, a repositor, and six cotton-wool wipes, mounted on probes.

The operation can be performed by two methods:

(A) By a linear incision upwards with a Graefe knife. The pupil being contracted by pilocarpin (not eserin) a puncture and counter-puncture are made in the sclerotic 8 mm. from each other, and 1 mm. from the limbus with the points of entry into and exit from the conjunctiva as far from the limbus as possible, a scleral flap 2 mm. to 2.5 mm. high and a conjunctival flap

extending to 8 mm. from the limbus are cut (Fig. 6), the conjunctiva is freed

FIG. 6.—Diagram of sclerectomy of the anterior lip with a punch-forceps after incision with a narrow von Graefe's knife.

with Dowell's (or curved blunt-pointed) scissors from the anterior lip of the scleral flap and raised with a forceps, a piece of the scleral flap, 3 mm. long by 1·5 mm. broad, is removed by the punch-forceps, and a small extra-sphincteric iridectomy is performed, unless the iris prolapses, when an ordinary iridectomy is done. The conjunctiva is then carefully replaced, and, as a rule, requires no suture. This procedure is suitable for cases with slightly increased tension and a high degree of direct astigmatism, as it causes considerable inverse astigmatism. It is the easiest operation, and can be performed without an assistant.

(B) By a 6mm. subconjunctival incision, usually upwards, with a keratome. The pupil being contracted by pilocarpine, the conjunctiva is punctured 1·0 mm. from the limbus, and the keratome passed down beneath it to a point 2·5 mm. from the limbus (Fig. 7), where the sclerotic is punctured. The bulbar

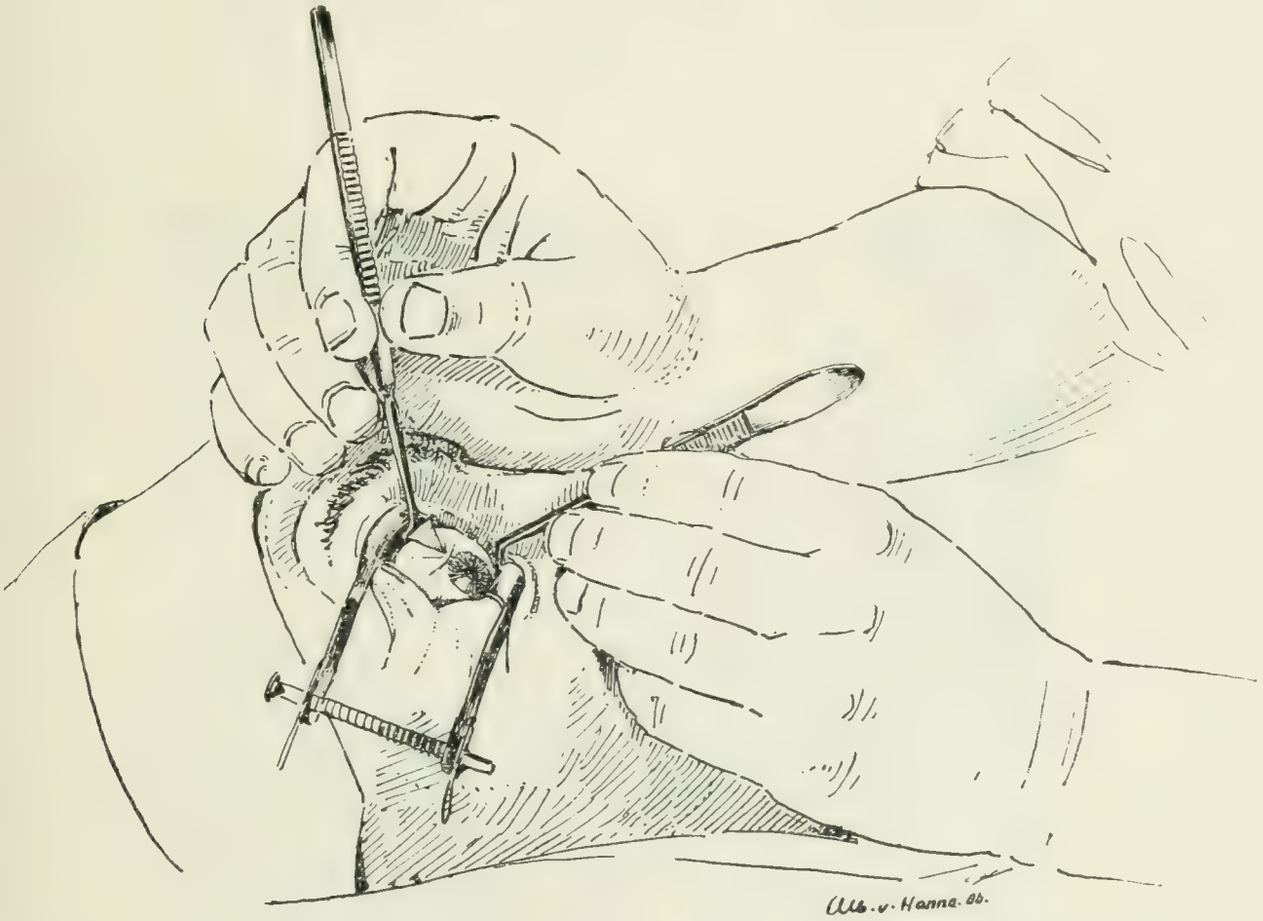


FIG. 7.—Subconjunctival incision upwards with a keratome. The point of the knife pierces the conjunctiva 10 mm. above the cornea and presses it down to enter the sclerotic 2·5 mm. from the limbus and penetrate obliquely into the anterior chamber. The fixation forceps is that illustrated in Fig. 2.

conjunctiva is then freed with blunt-pointed scissors between the scleral wound and the limbus (Fig. 8). With the help of the curved forceps, the conjunctival flap

FIG. 8.—The inferior edge of the conjunctival wound is raised with the forceps, and subconjunctival cuts are being made with Dr. Dowell's forceps scissors between the scleral wound and the limbus (this is unnecessary in sclerectomy of the posterior lip, Fig. 12).

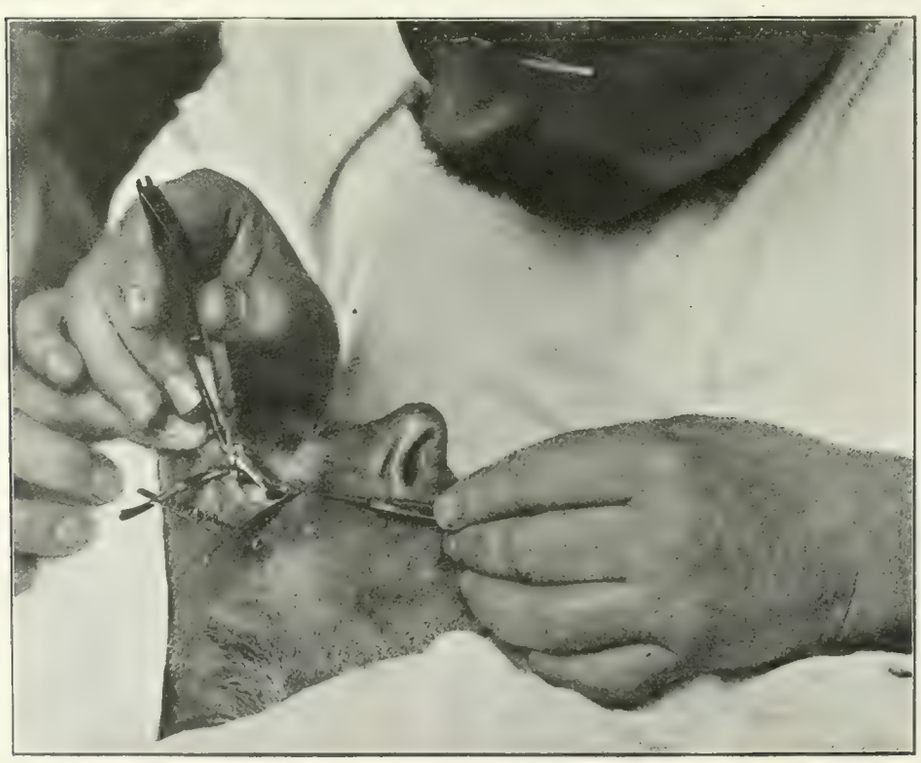


FIG. 9.—Scleral excision of the anterior lip with the punch-forceps after keratome incision. The operator stands preferably on the patient's left side and holds the double blunt hook (Fig. 4) himself

is caught on the double blunt hook and pulled down, so as to lay bare the scleral wound, the lower blade of the punch-forceps is introduced into the incision until 1·5 mm. of sclerotic is seen through the upper blade, when it is cut off rapidly (Fig. 9). The blunt hook is then handed over to an assistant, and a peripheral iridectomy is performed, so as to avoid prolapse of the iris (Fig. 10).

FIG. 10.—Excision of the periphery of the iris. The operator is behind the patient, and holds the iris forceps with stop screw in his left hand and de Wecker's forceps scissors in his right hand. The assistant holds the double blunt hook (Fig. 4).

Finally, the conjunctival flap is replaced with the spatula (Fig. 11). A

FIG. 11.—Diagram of a sclerectomy of the *anterior* lip with a punch-forceps through a keratome incision.

complete iridectomy is done if the iris prolapses, if there is central opacity of the cornea or lens, or if there is a cataract which will require extraction later. The entire sub-conjunctival pocket can be made with scissors right up to the limbus, and the keratome used for the scleral puncture only. This is more tedious, but probably preferable for lateral operations.

Since June 16th, 1908, Holth has performed his operation 30 times. He claims priority over L. Dor, who practised a similar procedure for the first time in October, 1908.

In his first ten cases he made his scleral incision 0·5 mm. from the limbus freed the conjunctiva, and pulled it down with the hook, then depressed the corneal edge of the incision with the lower blade of the punch-forceps, which he slipped backwards, so that on closing the instrument he excised a piece of

the posterior lip (Fig. 12). The piece of sclerotic excised by this means was bigger than that removed from the anterior lip, but not in so favourable a position. In all these cases fistulous cicatrices and normal tensions were obtained, but in two instances the good return were not maintained. Holth

FIG. 12.—Diagram of a sclerectomy of the *posterior* lip with a punch-forceps through a keratome incision.

however, suggests that he may return to this method, as he thinks that these failures may have been owing to defects in the punch-forceps, which had not been perfected at the time he performed it.

In the remaining 20 cases the sclerectomy was performed on the anterior lip, and always produced a fistulous cicatrix when the piece of sclerotic removed was sufficiently large (*i.e.*, 1·5 mm. broad).

FIG. 13.—Sagittal section through the cicatrix of a sclerectomy of the anterior lip with Vacher's punch-forceps through a keratome incision (6 weeks after the operation). Magnification, 42 diameters.

Holth considers that it is of the utmost importance to free the conjunctiva thoroughly, as otherwise some of it is included in the excised tissue. This happened to him twice, and in both cases the conjunctival epithelium grew down into the scleral opening, which cicatrised in the customary fashion without producing any conjunctival œdema. He gives a microphotograph (Fig. 13) of a section of an eye obtained from a patient who died of pulmonary

embolism following a fracture of the femur six weeks after the operation on the eye in which in spite of the fact that the scleral flap measured only 1 mm. there was fistulisation with normal tension and marked improvement of visual acuity and field. The section shews that the scleral excision did not reach the anterior chamber, but the posterior lip of the scleral incision folded backwards on the ciliary body so as to permit the fistulisation. There was no sign of reaction in the sclera, the wound in which was filled with loose connective tissues derived from the conjunctiva. In the outer two thirds of the wound cicatricial reaction of the scleral tissue was prevented by this transplantation of the subconjunctiva into the gap in the sclerotic, while in the middle third its absence seems to have been due to the action of the aqueous.

The advantages claimed for sclerectomy,after incision with a keratome are freedom from risk of expulsive hæmorrhage or rupture of the zonule, and the slight amount of the astigmatism produced, which amounts to 0·5 D. or 1 D. only

Holth considers that the following three conditions must be fulfilled before an operation for the cure of glaucoma by the production of a fistulous cicatrix can be considered to have fulfilled the purpose for which it was devised, and postpones publication of his results until sufficient time has elapsed to allow of their being fulfilled in a series of cases :—

1.—There must be conjunctival œdema over and around the scleral wound, showing the presence of a subconjunctival fistula.

2.—The tension must be constantly normal or sub-normal, as shown by the tonometer.

3.—For two years after the operation, the visual acuity and fields (which often improve to a marked extent) must not become worse than they were before.

Finally, Holth expresses his opinion that although the classical iridectomy is still indicated in acute glaucoma, yet Lagrange's idea was a most happy one, and that anterior subconjunctival sclerectomy is destined to be the basis of all the future surgical treatment of chronic glaucoma.

R. J. COULTER.

XI.—THE TREATMENT OF SIMPLE GLAUCOMA.

Bjerrum.—On the treatment of simple Glaucoma. (**Sur le traitement de glaucome simple.**) *L'Ophtalmologie Provinciale*, mars, 1909.

In this article **Bjerrum**, of Copenhagen, describes his treatment of simple glaucoma. Remarking on the diversity of opinion with regard to the early performance or otherwise of iridectomy in these cases, and referring to the statistics on results, he points out that the more operations are performed in the earlier stages of the disease the greater will be the number of cases which are cured or alleviated by this method, as opposed to the continued use of myotics, although it does not follow that a number of these cases would not have remained stationary under the latter treatment alone. He maintains that many cases of simple glaucoma can remain stationary for many years, or even permanently, by a sufficient use of myotics alone ; that iridectomy is not without some risk in more than one respect, even without counting that the most successful operation does not always produce the desired effect. He appears to be emphatically against operation unless, as he says, one is absolutely sure of not being able to ameliorate or to arrest the progress of the disease by myotics. In the treatment of a case he emphasizes the importance of examining the

field of vision, not only at the ordinary perimetric distance with a white object of 1 to 2 cm. diameter, but also at a distance of 2 metres with an object of, say, 6 mm. diameter, after the method described by himself some twenty years ago. Of still greater importance, however, is the use of the tonometer of Schiötz, for by means of this instrument variations in tension are shewn which do not reveal themselves by subjective or objective signs, and the estimation of tension is thus far more accurately made than by palpation alone. If, in a case, the tension is not maintained at normal (as shewn by the tonometer) by the use of myotics alone, *e.g.*, pilocarpine with or without eserine, Bjerrum then proceeds to operation. He performs a simple sclerotomy, differing somewhat from the ordinary, and uses a narrow Græfe knife with a thick back and a two-edged point. In operating on the right eye he stands behind the patient and makes the section downwards, coming out below the cornea; for the left eye, he stands in front, making the section upwards and the knife emerges above the cornea.

By this method the point of the knife from entry to exit is better seen. The conjunctiva, before puncturing, is displaced slightly with the point of the knife, as in Holth's and other similar operations, puncture and counter-puncture are made at the limbus, and the knife is carried across the anterior chamber close to the iris. It is then directed obliquely, so that it comes out through the sclerotic beneath the conjunctiva at a distance of 3 mm. to 6 mm. from the edge of the cornea (below in the right eye, and above in the left). The aqueous, draining into the incision, raises the conjunctiva, and whilst this is taking place it is necessary to hold the knife steady, afterwards withdrawing it slowly and with a sawing movement, by means of which the section is made a little wider. After the operation, the pupil is often a little displaced and rendered oval, with the long axis parallel to the direction of the section. Hæmorrhage of any importance rarely appears in the anterior chamber, and only insignificant inflammations follow the operation; sometimes, however, when these persist for some time, posterior synechiæ are left, although in such cases Bjerrum noted that the operation had a particularly beneficial action in reducing the tension. If, a week after the operation, tension is not normal, massage, by pressure on the cornea through the upper lid, is resorted to. By practising this on the cornea and not on the sclerotic, the writer maintains that one may better expect a dilatation of the excretory vessels at the circumference of the anterior chamber, whereas pressure on the sclerotic is likely to produce the opposite effect by pushing forward the lens and iris. Massage is, when necessary, begun on the 5th or 7th day and performed for 1 minute daily for as many days as may be considered desirable. Bjerrum describes a case in which the tonometer showed that myotics after 3 months did not reduce the tension to normal, although the vision improved from $\frac{3}{36}$ to $\frac{5}{12}$. Sclerotomy after his method was then performed, and nine months later the tension, which had been reduced to normal by the operation, was still so, and the vision $\frac{5}{12}$. In conclusion, Bjerrum considers his sclerotomy to be a smaller and easier operation than iridenctomy, the iridencleisis of Holth, or Lagrange's sclerectomy, and says that if sclerotomy fails, although followed by massage and the continued use of myotics, one may very well, sooner or later, proceed to one of these operations, preferably Holth's, which is, in his opinion, a good one.

BERNARD CRIDLAND.

XII.—OPHTHALMOPLEGIC MIGRAINE.

(1) **Fisher, J. Herbert.—Transient ophthalmoplegia externa associated with attacks of severe headache.** *Ophthalmic Review*, February, 1907.

(2) **Veasey, C. A.—Ophthalmoplegic migraine involving the abducens nerve, with the report of a case.** *Ophthalmic Record*, August, 1909.

(1) In this communication **Fisher,** of London, records five cases in which a transient ophthalmoplegia externa was associated with attacks of severe headache. Although there is room for speculation as to the diagnosis of any one of them, they are considered to be closely allied to those reported by W. T. Holmes Spicer and J. A. Ormerod in Vol. XVI of the *Transactions of the Ophthalmological Society*. The pain in Fisher's cases was occipital in two, occipital followed by retro-ocular in one, primary retro-ocular in one, and in the other case it involved the temporal, malar, and frontal region of one side. Few opportunites have occurred for autopsies in these cases, which are sometimes termed instances of ophthalmoplegic migraine, but plastic exudation has been found in the basal subarachnoid spaces, with fibrous adhesions round the origin of the third nerve extending forwards to the chiasma. Other *post-mortem* examinations have shown a fibroma, a chondro-fibroma amid the fibres of the ocular nerve involved; nuclear lesions have never been found. Details of the five cases are given, of which four were in males and one in a female.

C. DEVEREUX MARSHALL.

(2) Ophthalmoplegic migraine (Charcot) affecting cranial nerves other than the third is, according to **Veasey,** of Spokane, Washington, of very rare occurrence. Such cases have been reported by Charcot, Paderstein, and de Schweinitz. Veasey's own case was observed in a girl, six years of age, who for two years had been subject to violent paroxysmal pain in the left side of the head, lasting for an hour or so, and always followed by nausea and vomiting. Photophobia was usually present during the attacks. Two of the more recent attacks had been followed by diplopia and convergent squint of the left eye. The paresis was temporary. For the rest, the child looked well, had a rosy colour, and, according to the mother's view, was perfectly well, except for the recurrent headaches and their associated symptoms.

SYDNEY STEPHENSON.

XIII.—THE ZONULE OF ZINN.

Mawas, J.—Investigations as to the origin and histological significance of the fibres of the Zonule of Zinn. (Recherches sur l'origine et la signification histologique des fibres de la Zonule de Zinn.) *Comptes rendus de l'Association des Anatomistes Marseille*, 1908.

Mawas (Histological Laboratory of Lyons Faculty of Medicine) after putting on one side all theories as to the origin of the Zonule of Zinn from the hyaloid membrane of the vitreous, and referring to various theories of its origin from the ciliary epithelium (Collins, Schoen, Terrien, Damianoff, etc.), proceeds to the account of his own researches. He comes to the conclusions that: (1) the fibres of the zonule have their origin in the epithelium which covers the ciliary body (*pars ciliaris retinæ*), from the *ora serrata* to the irido-ciliary angle; (2) the zonular fibres are not protoplasmic pro-

longations of the cells of the ciliary epithelium, nor yet simply attached to this epithelium; (3) they take origin from the internal surface, and from the sides of the cells of the ciliary epithelium, by a thin membrane differentiated here (*d'une mince cuticule differenciée à ce niveau*). Generally, they arise from the upper third of the cells; (4) the zonular fibres are neither connective, nor elastic, nor sustentacular (Müller's fibres); (5) they are cuticular formations, "*formations exoplastiques*," products of the transformation or elaboration of the protoplasm of the ciliary cells, and differentiated at the boundary of the cellular territories (*et différenciées à la périphérie des territoires cellulaires*). ERNEST THOMSON.

XIV.—COMMUNICATIONS DEALING WITH THE SURGICAL TREATMENT OF CATARACT READ AT THE ELEVENTH INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

(1) **Valude, E.—On the operation for cataract.** (**Sur l'opération de la cataracte.**) *XI Congresso Internazionale di Oftalmologia*, Aprile 2-7, 1909, p. 136.

(2) **Elschnig, A.—Intracapsular extraction of senile cataract.** (**Die Extraktion des Alterstares in der Kapsel.**) *Ibidem*, p. 199.

(3) **Gidney, H.—The treatment of immature cataract.** *Ibidem*, p. 209.

(4) **Villard, H.—Irrigation of the anterior chamber for cataract.** (**Le lavage de la chambre antérieure dans l'opération de la cataracte.**) *Ibidem*, p. 203-208.

(5) **Folinea, Guido.—A case of cured detachment of the retina: successful operation for cataract.** (**Un caso do antico distacco di retina guarito: operato felicemente di cataratta.**) *Ibidem*, p. 538, II.

(1) **Valude** (Paris) is in favour of a corneo-scleral suture to close the incision and to allow of thorough irrigation of the anterior chamber without any danger of prolapse. The operation should be carried out as follows: (1) insertion of the suture; (2) simple extraction; (3) irrigation and aspiration of any remaining lens-matter. This he calls the radical cure of cataract. In order to be successful, the suture must be inserted according to the minute instructions of Kalt, who has employed it for the last fifteen years. Very fine, round, fully-curved needles and the finest linen thread (not silk) must be used. The needle is introduced 1½-2 mm. below the limbus, passed through half the thickness of the cornea, and out again (still in the cornea) about 1 mm. from the limbus; it is then passed from above downwards through the conjunctiva and the superficial layers of the sclera. After the extraction of the cataract, the suture is tied, the irrigator introduced, and the capsule freely washed out. The patient does not lie up, or only for a day; no dressing. Atropine on the second day and a light bandage and dressing. Removal of the suture on the third or fourth day. The dressing can be omitted not unfrequently on the sixth day, and the patient allowed to wear dark glasses. PERCIVAL J. HAY.

(2) **Elschnig** (Prague) comments upon 264 cataract extractions he performed between October, 1907, and February, 1909, and refers more particularly to 63

extractions according to the method advocated by Major Smith, 34 of them without and 29 with iridectomy. Fifteen were unsuccessful, *i.e.*, the capsule burst in 9, and vitreous appeared before the lens in 6, necessitating removal of the latter with a spoon. Of the simple extractions the capsule burst in 5, the lens had to be removed with a spoon in 3, vitreous escaped in 6 (never very much), vitreous appeared in the anterior chamber in 2. Vitreous, therefore, presented in 17·6 per cent and 23·5 per cent. respectively. Prolapse in the first 24 hours occurred 12 times = 40 per cent. No iritis. Results fair (0·1—0·2) in 9, otherwise very good. These results are compared with 71 cases of simple extraction with capsulotomy performed during the same period. Vitreous presented in 1·4 per cent. ; iris prolapsed in 5·6 per cent. ; subsequent needling necessary in 3 cases only. The author sums up as follows.—In view of the circumstance that loss of vitreous is a very unpleasant accident, the effect of which upon the eye is not a negligeable quantity, simple extraction in the capsule must be condemned outright With regard to the 25 extractions with iridectomy, the capsule burst in 4, and vitreous presented in 3, necessitating removal of the lens with the spoon. In the 22 successful cases vitreous presented in 3, *i.e.*, in 16·7 per cent. The results were fair in 9, very good in the other 20. Elschnig does not think that faulty *technique* had anything to do with the results, because vitreous did not escape in any of the first 7 cases, and the capsule burst only once in the first 13. He believes the escape of vitreous is due to adhesions existing between the capsule and the lamina vitrea. If these adhesions are easily separated, the lens rotates upon its horizontal axis and presents with its lower border (as is often the case) and no vitreous escapes. If, on the other hand, these adhesions are tough, the lens presents with its upper border and the vitreous either appears before the lens or is seen to follow the traction on the lens. In the author's opinion, there are no outstanding advantages to balance the disadvantages of intracapsular extraction, and the best operation at present is simple extraction with rupturing of the capsule with capsule-forceps, provided there is no iridonesis or high myopia. Intra-capsular extraction should only be tried in these cases in which a round pupil has to be sacrificed. If it does not succeed easily, it must be given up at once in favour of ordinary extraction.

PERCIVAL J. HAY.

(3) **Gidney** (East Indies) advocates removal of the cataract (excluding those cases in which there are justifiable grounds for delay) in every case in which the sight is too defective to allow the patient to follow his usual occupation, irrespective of the ripeness or otherwise of the cataract, and urges that by this means we restore good vision with a minimum period of incapacitation, and at a time when the general systemic resistance and reparative powers are at a higher level and unaccompanied with other signs of senility. He holds that we should not allow our patients to endure the unhappiness, anxiety, loss, and mental depression which they are bound to undergo in waiting for the progress to maturity of a cataract which lies between the advent of that degree of blindness which incapacitates them from performing work of any kind, and the time, which may be years, when that degree of maturity has arrived, when only a successful extraction can be performed. He draws attention to anatomical conditions, peculiar and common to immature cataract : (1) the lens being swollen it is, as a rule, of large size and requires a large incision and a large iridectomy for easy extraction ; (2) the capsule is firm and seldom ruptures; (3) the attachment of the zonule being loose, the lens is likely to be dislocated if artificial maturation is attempted, but, on the other hand, is easily extracted by the intra-capsular method ; (4) tension is at times slightly varied for obvious reasons; this demands

a discriminate use of the speculum, an instrument which is better discarded. In his opinion, iridectomy with intra-capsular extraction is the operation of election in immature cataract and has the following advantages: (1) the cataract can be extracted in any stage of its maturity. (2) No preliminary operation is necessary, as both iridectomy and extraction are done at one sitting. (3) The entire lens in its capsule is got rid of. (4) Iritis is practically excluded as an after-complication. (5) The absence of need for a subsequent discission. (6) Shortened convalescence. (7) Fewer instruments. (8) Atropine is unnecessary in the after-treatment. (9) A higher degree of visual acuity, especially $\frac{6}{6}$, results. (10) The patient is given a longer life of usefulness. Stress is laid upon the following points in the operation, to avoid rupture of the capsule and escape of vitreous.—(1) The incision must be large and embrace at least the entire horizontal diameter of the eye just within its sclero-corneal junction; it must be so situated at its summit as to afford a mechanical obstruction to an escape of vitreous and prolapse of the iris and at the same time to facilitate extraction. (2) The assistant must be an experienced and reliable man and thoroughly efficient in the use of the retractor, and to him must be given all the credit of a low percentage of vitreous escape and *vice-versâ*. (3) The eye speculum should be used sparingly or not at all. (4) The dressing should not be removed till the fourth day, unless untoward symptoms necessitate an earlier examination. (The iris rarely prolapses, if eserine is used.) (5) Experience and manipulative dexterity play an important *rôle*. (6) There must be no haste. PERCIVAL J. HAY.

(4) **Villard** (Montpellier) uses Aubaret's two-way syringe* (made by Lüer, Paris) for irrigating the anterior chamber. The action of the syringe is to inject and at the same time to aspirate the fluid injected. The latter collects behind the piston. The fluid which the author uses is an artificial aqueous humour, consisting of aq. dest. 1,000, sod. chlor. 6·8 gs., calc. chlor. 0.113, and pot. sulph. 0·221. The osmotic pressure of this solution is practically the same as that of the aqueous humour, and therefore it does not cause any histo-chemical changes in the delicate structures lining the anterior chamber. It is sterilized in the autoclave for half an hour at 135°C, and kept in bottles containing 100 cc. Before operation it is warmed to body heat in a water bath. Details are given of the mode of using the instrument, the management of which does not appear to present any difficulties. One syringeful or two is sufficient to remove all the soft lens matter and leave a jet-black pupil. The author claims that the results are equal, if not superior, to the classical operation. No statistics are given. PERCIVAL J. HAY.

(5) The patient, a peasant, aged 34 years, was treated successfully by **Folinea**, of Naples, in 1894, for detachment of the retina. The treatment included subcutaneous injection of pilocarpine and scleral puncture. The man's sight remained much improved until last year, when it again failed, but this time from opacity of the lens. Simple extraction, after the method of Angelucci, was performed, and V.=6/36 resulted. HAROLD GRIMSDALE.

* See THE OPHTHALMOSCOPE, 1905, p. 347.

XV.—REMEDIES.

(1) **Blaaüw, E. E.**—The value of correcting glasses in general pathology, and the method of determining the correction. (La valeur des verres correcteurs dans la pathologie générale et la méthode de détermination.) *XI Congresso Internazionale di Oftalmologia*, 1909, fasc. primo, p. 31. 15

(2) **Schanz, F. and Stockhausen, C.**—On protective glasses. (Ueber Schutzbrillen.) *Ibidem*, p. 235.

(3) **Fumagalli, A.**—The treatment of blepharospasm and spastic entropion by the subcutaneous injection of alcohol. *Annali di Ottalmologia*, Vol. XXXVIII (1909), fasc. 3.

(4) **Bornancini.**—Blood-letting in ophthalmology. (Le sottrazioni sanguigne in oculistica.) *Annali di Ottalmologia*, Vol. XXXVIII (1909), fasc. 3.

(5) **Moretti, E.**—Oxide of mercury ointment. (Le pomate oftalmiche agli ossidi di mercurie.) *Annali di Ottalmologia*, Vol. XXXVIII (1909), fasc. 4.

(6) **Pignatari, R.**—The organic salts of silver (protargol, argyrol, sophol) in ocular therapeutics. (Le combinazioni organiche di argento—protargolo, argirolo, sofolo—in terapia oculare.) *Annali di Ottalmologia*, Vol. XXXVIII (1909), fasc. 6-7.

(7) **Stephenson, Sydney.**—On the influence of correcting errors of refraction in some of the functional neuroses of children. *British Medical Journal*, September 18th, 1909, p. 751.

(8) **Davidson, Jas. Mackenzie and Lawson, Arnold.**—A case of spring catarrh treated and cured by radium. *Trans. Ophthal. Society U.K.*, Vol. XXIX, 1909, fasc. 3.

(9) **Lawson, Arnold and Davidson, Mackenzie.**—A preliminary note on the treatment of eye disease by radium. *Ibidem*, p. 306.

(1) **Blaaüw** (Buffalo) considers that clinicians do not sufficiently appreciate the value of correcting refractive errors, and draws attention to some well-known symptoms of asthenopia. In the second part of his paper he enters a protest against determining refractive errors with a mydriatic. He regards the method as unscientific, objectionable, troublesome for the patient, and unnecessary. In his opinion, all that is needed is an approximate estimate of the degree of error by the direct method, supplemented by the findings of an ophthalmometer, and, in doubtful cases, by retinoscopy.

PERCIVAL J. HAY.

(2) **Schanz** and **Stockhausen** (Dresden) recommend a glass they call "Euphos glass" for protection against the ultra-violet rays. It absorbs the latter more effectually than does the Fieuzal or the "enixanthos glass," and is superior to the heavy flint manufactured by Schott and Genossen. Euphos glass is yellowish-green, and is sold in various shades. No. 3 prevents the fluorescence of the lens caused by an arc lamp of 10 amperes, and therefore should be sufficient to protect the eyes from the ultra-violet rays of the most intense light. At the same time it is more nearly colourless than the varieties of glass already mentioned. When protection is desired against the visible rays,

the authors recommend smoked glass, as this affects all parts of the spectrum in equal degree, whereas coloured glass does not Smoked glass combined with Euphos glass offers the best protection against the visible as well as the invisible rays of the spectrum, and it can be used in lighter shades with better results than have hitherto been possible with smoked glass alone.

PERCIVAL J. HAY.

(3) At **Fumagalli's** clinique at Turin injections of alcohol for the relief of blepharospasm and spastic entropion are made not deeply in the neighbourhood of the stylo-mastoid foramen, but under the skin in the region of the supra-orbital nerve and of its palpebral filaments and in the territory of the orbital filaments of the facial nerve, so as to affect especially the orbicularis muscle. Solution for injection: absolute (96 per cent.) alcohol, 30 grammes; sterilised distilled water, 60 grammes, without any anæsthetic. The contents of a Pravaz syringe full of the liquid are injected into the supra-orbital region, and another in the infra-orbital region in long-standing cases of essential. blepharospasm. In spasmodic entropion (children, old people) one injection beneath the skin of the eyelid, parallel to the free border, will suffice. Several injections may be made at intervals of every two days or longer until the case is cured or, at least, much improved. A. ANTONELLI.

(4) **Bornancini**, of Modena, writes upon blood-letting in ophthalmology. From the clinical standpoint, the effect of letting blood from the temple or the mastoid, or from both places at the same time, appears to be incontestable, especially in cases of exudative anterior uveitis (plastic iritis or irido-cyclitis). Leeches are much better than Heurteloup's instrument or wet cups. Pain is relieved, and the action of atropine is much facilitated by blood-letting. Experiments have been made by the author upon rabbits, first submitted to the action of a leech applied to the temporal region, and then to the intraperitoneal injection of uranine, 20 per cent, or of potassium iodide solution, 1/3, in order to seek in the aqueous humour or the vitreous the substance placed in circulation, comparatively in the eye of the side operated on and in its congener. With uranine, the results were doubtful, sometimes negative; but with the iodide the chromatic action and reaction upon starch was clearly the more rapid as regards the fluid of the eye influenced by the bleeding than as regards the fluids of the other eye. It seems, then, to be proved that bleeding hastens the lymphatic currents of an eye in the normal as well as in the pathological state.

A. ANTONELLI.

(5) Everybody is familiar with the drawbacks to the use of yellow or red oxide of mercury ointment, when the preparation is defective. According to **Moretti**, of Milan, the following conditions must be fulfilled if the ointment is to be perfectly tolerated:—(1) an absolutely perfect porphyrisation of the oxide (the red oxide must be manipulated much longer than the yellow, and it is well to add to it one or two drops of the oil of almond or of cade, which also help to keep the preparation); (2) the recent preparation of the yellow oxide by the precipitation of the bichloride, etc. . . . . (3) As to excipients, hog's lard has been mistrusted, since the traces of sodium chloride it contains may, in the presence of the oxide of mercury, determine the formation of sublimate and of caustic soda. On the other hand, as compared with lard, neutral excipients, such as vaseline and lanoline, have the disadvantage of not permitting the saponification of traces of soda produced by contact of the ointment with the secretions of the conjunctival sac, rich in chlorine. Lard must therefore be preferred, but on the conditions that it is fresh, pure, and perfectly washed. (4) The ointment must be kept in opaque and hermetically closed receptacles. A. ANTONELLI.

(6) The communication of **Pignatari**, of Florence, concerning the organic salts of silver, represents a considerable amount of labour, some of it experimental. It deals with the antiseptic power of these preparations *vis-à-vis* different micro-organisms (diplococcus, streptococcus, Klebs-Löffler bacillus), with the opsonic power, with the action upon protoplasm, blood, and vessels, with the coagulative and anti-fermentative action, and, lastly, with the clinical results.

The conclusions are as follows.—The solutions of the three preparations of silver, namely, protargol, argyrol, and sophol, must not be made with heat, since heat provokes oxidation of the protein and thus causes the solution to become irritating. As they are readily altered by the action of light, they should be stored in amber-coloured glass bottles, except sophol, which should be kept in a dark flask. The solutions are not astringent—that is to say, their action cannot be explained by vascular constriction. Neither are they hæmostatic. Indeed, as regards blood, they have, especially the solution of sophol, anti-coagulative properties. The preparations are in no sense caustic. They act upon the cells of living protoplasm—first, by exciting, and, afterwards, by paralysing them Solutions still compatible with the life of the protoplasm are for argyrol 1 : 200,000, for protargol 1 : 512,001, and for sophol 1 : 180,850. Sophol, therefore, is the least toxic.

Protargol is a good bactericide, while argyrol and sophol are less active. With regard to the antiseptic power, we may affirm that in a solution of 1 : 10,000 protargol inhibits the development of a culture of the pneumococcus and of the streptoccocus. A solution of argyrol 1 : 5000 is necessary to inhibit the development of the diplococcus, while for the streptococcus a somewhat stronger solution is necessary, 1 : 3330. Sophol behaves itself under these circumstances almost like argyrol, but a solution of 1 : 5000 is required against the streptococcus and of 1 : 3330 against the pneumococcus. A solution of 1 : 5000 of any of the three preparations is adequate against cultures of the s. p. aureus and of the Klebs-Löffler organism.

In vitro the three preparations raise the opsonic index and opsonins, and for that purpose sophol is the most active. This preparation in weak solution might accordingly be tried by interstitial injection into the cornea in cases of non-perforating ulcer, or by injection into the cornea and the anterior chamber in cases of deeper infection. The beneficent irritative action should bring about the support of the plasma and the leucocytes.

Since protargol does not coagulate albumin, it can penetrate all the folds of the conjunctiva. On this account it is more antiseptic than silver nitrate, which by its caustic action coagulates albumin, while by provoking the formation of an eschar, it precludes all diffusion into the depths of the tissue. Neither argyrol nor sophol coagulates albumin. They are less active than protargol in catarrhal forms of conjunctivitis, as well as in purulent conjunctivitis. At the same time they are very efficacious in catarrhal conjunctivitis, accompanied by moderate secretion, and they have the important advantage of causing not the least pain. Sophol is better tolerated than argyrol, and on that account should be preferred in cases that are already accompanied by pain or pronounced symptoms of irritation. Both preparations are particulary indicated in cases of conjunctivitis complicated by lesions of the cornea.

When papillary hypertrophy is present, the organic preparation can only diminish the secretion from the eyes, and we must then resort to silver nitrate, which under these circumstances remains our most trustworthy remedy. The slighter cases may be improved by zinc sulphate or the Viennese yellow collyrium.

No salt of silver should be employed for long together on account of the risk of argyrosis, although that drawback, according to Darier, may be avoided by the use of sublimate lotion. A. ANTONELLI.

(7) In the course of a discussion upon the functional neuroses of children, opened by J. A. Coutts, of London, **Stephenson**, also of London, insisted upon the necessity of correcting errors of refraction, no matter how apparently trivial, in the disorder known as "Habit-Spasm." In his experience, when blinking of the eyelids was the chief manifestation of the condition, the provision of spectacles would often check the curious "tic" at once. He quoted six cases in illustration of his views. S. S.

(8) **Davidson** and **Lawson**, of London, report a severe example of the palpebral form of spring catarrh in a lad of twelve years, which did not yield in nine months to ordinary measures, although weak copper sulphate drops, as well as a lotion of sodium bicarbonate with opium and hydrocyanic acid, afforded a measure of relief to the symptoms. Radium was then applied directly to the tarsal aspect of the eyelids. The applications were spread over a period of about twelve months, during which eight sittings were given, each eye being treated seven times. Tubes containing from 29 to 44 mgrm. of radium bromide were employed, and exposure lasted from one minute to fifteen minutes. There was no pain, either immediate or remote. The result was excellent, and cure has lasted for upwards of two years. Stress is laid upon the employment of a relatively large quantity of radium.

SYDNEY STEPHENSON.

(9) In the present communication (read on July 9th, 1909) **Lawson** and **Davidson**, of London, describe the results they have obtained by radium* in the treatment of certain external diseases of the eye. The eye was placed under the influence of cocaine, and the radium, enclosed in glass tubes, was applied directly to the affected part. Beyond irrigation with boric lotion, no other treatment was applied. The cases, which numbered seventeen in all, included corneal ulcerations (10), non-ulcerative lesions of the cornea (4), inflamed pterygium (2), and recurrent episcleritis (1). The results were excellent in three of the cases of hypopyon-keratitis, which yielded to from one to three exposures to an amount of radium that varied from 25 mgrm. to 49 mgrm. The two cases of pterygium yielded to radium, a remark that applies also to the case of episcleritis, which had been under treatment for upwards of two months before it was cured by a single exposure of ten minutes to 59 mgrm. of radium. The authors consider that it is at the present moment impossible to make any statement with regard to the relationship subsisting between size of the dose, on the one hand, and effect produced, on the other. In almost all their cases an exposure of five minutes was adopted, and that was seldom if ever followed by reactional symptoms, such as pain or inflammation. They note, however, that exposures for ten minutes or longer are usually succeeded by pain, together with an increase in the subjective symptoms of the disease. They conclude that radium is "a very powerful and successful agent in the treatment of eye diseases."

SYDNEY STEPHENSON.

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* Recent references to the use of radium in affections of the eye will be found in THE OPHTHALMOSCOPE of 1908, p. 782, 783, and 919, and in the volume for 1909, p. 271 and 636. S. S.

XVI.—DETACHMENT OF THE RETINA.

(1) **Domec.—Differential characteristics of idiopathic retinal detachment and detachment secondary to sarcoma of the choroid.** (Caractères différentiels entre un décollement de la rétine idiopathique et un décollement secondaire à un sarcome de la choroide.) *L'Ophtalmologie Provinciale*, T. V, p. 171, novembre, 1908.

(2) **Lauber, H. — On detachment of the retina.** (Ueber Netzhaut Ablösung.) *Zeitschrift für Augenheilkunde*, August and September, 1908.

(3) **Leber, Th.—On the cause of retinal detachment.** (Ueber die Entstehung der Netzhautablösung.) *Bericht der Ophthal. Gesellschaft*, Heidelberg, 1908 (Volume published in 1909, p. 120).

(4) **Wilson, Thomas, and Hird, R. B. A case of retinal detachment in pregnancy associated with nephritis.** *Lancet*, July 17th, 1909.

(2) **Lauber** (Vienna) discusses the causes of detachment of the retina, and describes cases of the disease, or rather symptom. There are two schools of thought, of which one believes the retina to be pushed off by fluids accumulating between it and the choroid, while the other holds that it is drawn off by shrinking of the vitreous. The author points out that in one group of cases the former view is undeniably correct—as, for example, when detachment follows an albuminuric retinitis; in a second group, including proliferative retinitis and perforating wounds, the retina is equally certainly pulled off by contracting bands. But in the large majority of cases the mechanism of detachment acts from behind not in front of the retina. The paper contains nothing absolutely new or specially striking, but it is a useful summary of the known facts. T. HARRISON BUTLER.

(3) This paper attempts to substantiate the theory that detachment depends upon contraction of structures anterior to it, and not upon a subretinal collection of fluid. **Leber** (Heidelberg) thinks that the presence of numerous small folds in the detached membrane, the universal presence of cellular thread-like tissue, the presence of spontaneous perforations, the participation of the *pars ciliaris*, and other facts, all render this view the more probable one. The general trend of the discussion, however, did not support Leber's views. T. HARRISON BUTLER.

(4) **Wilson and Hird's** case is abstracted in the Review of Detachment of the Retina by Ernest Thomson in the present number of THE OPHTHALMOSCOPE.

BOOK NOTICES.

Atlas and Epitome of Ophthalmoscopy and Ophthalmoscopic Diagnosis. By Professor O. HAAB, of Zurich. Second American edition. Edited by G. E. de Schweinitz, A.M., M.D. Philadelphia and London: W. B. Saunders Company. 1909. Price 13s.

It would be difficult to speak too highly of Haab's well-known and widely appreciated *Atlas and Epitome of Ophthalmoscopy*, as edited by Dr. G. E. de Schweinitz, of Philadelphia. This is the second American edition translated

from the fifth enlarged and revised German edition. The book has filled a distinct want in both English and German-speaking countries. To the new edition we extend a hearty welcome. Some new chromo-lithographs have been added, with the result that the *Atlas* now comprises 152 pictures, many of the most representative kind. A useful feature (although not new to the present edition) is the inclusion of coloured plates of the microscopical appearances of the structures that go to make up the fundus oculi, as well as of diseased conditions met with in that region of the eye. There is little to be said in the way of criticism. But the figure (5, a) intended to represent the very dark fundus of a young eye, is not, we think, up to the level of the plates in general. The misprint in the description of Figure 87, which, curiously enough, is one of black circles representing the size of pupils, should be corrected ; the word "centimeters" should evidently read "millimeters." As a matter of fact, the text is singularly free from errors.

Ueber Keratitis Parenchymatosa nach Verletzung. Von JOSEPHINE HÖBEN von Hamburg. 1909. **Ophthalmic Essays.** Edited by Prof. Dr. DEUTSCHMANN. Part 73. **On Keratitis Parenchymatosa after Injury.** By Madame HÖBEN.

On several recent occasions there has been controversy upon the question whether keratitis parenchymatosa is invariably associated with hereditary syphilis. That there is a close connection between the two was first clearly pointed out by Sir Jonathan Hutchinson, but the researches of Michel and of E. v. Hippel have demonstrated that tuberculosis also frequently plays an important part in the development of the disease. The authoress of this pamphlet, Madame Josephine Höben, sets herself to show that an injury to the eye may lead to an inflammation of the cornea, which may justly receive the appellation of keratitis parenchymatosa traumatica. To support her contention, which, it is pointed out, is not a novel one, since various observers have described cases where a constitutional affection previously latent has been brought into activity by an injury, she has collected from various quarters no less than 28 cases of keratitis parenchymatosa, which have been reported during the last nineteen years, and the majority of which presented signs of lues or scrofula. Madame Höben then proceeds to give the details of four cases she has herself observed in the eye-clinic of the University of Zurich, and of a fifth case that occurred in the practice of Dr. Sidler-Huguenin. The first case was that of a porter aged 19, who presented signs of a luetic dyscrasia and had a well-marked attack of parenchymatous keratitis, first in the right and then in the left eye, resulting from exposure to the dust proceeding from a knife-polishing machine. Under treatment with atropin cataplasms, and injections, of a 5 per cent. solution of common salt, perfect recovery of vision took place, though at one time fingers only could be counted at 1 metre. In the second case, the eye of a man aged 27, was struck, but not penetrated, by a foreign body, which was removed by a fellow workman. Three months after the accident, parenchymatous keratitis was set up in both eyes, but inquiry into the patient's family and personal history elicited no evidence of either lues or tuberculosis. Partial recovery of vision took place. In the third case, some cement or mortar struck the right eye. A month later inflammation of the cornea supervened. Partial recovery of vision took place. In the fourth case, a straw-hat worker, aged 18 years and six months, got a piece of straw in her eye ; six days after, keratitis commenced in the injured eye, ran its course, and did not affect the opposite eye, which was

apparently suffering from hereditary syphilis. The fifth case had been under the care of Dr. Sidler-Huguenin. Some fragments of a composition for gilding had entered the patient's eye. There were no signs or history of syphilis, but well-marked keratitis parenchymatosa in both eyes followed, perfect recovery of vision resulting in one, and partial in the other. From these cases, Madame Höben draws the conclusion that there is such an affection as keratitis parenchymatosa traumatica. The scientific explanation of its production is still obscure. HENRY POWER.

Ueber Glaukom: seine Diagnose und Behandlung. (**Glaucoma: its diagnosis and treatment.**) By Prof. Dr. O. HAAB, Zurich. (Reprinted from *Correspondenz-Blatt für Schweizer Aerzte*, Jahrg. XXXIX (1909).

This pamphlet is a reprint of a lecture delivered by Professor Haab before the Medical Society of Canton Zurich. It cannot be said to contain anything strictly new, and the author would be the last to make such a claim for it, but such a lucid *résumé* of a most important subject is a welcome contribution to the literature. The writer deals, in the first place, with the difficulties of diagnosis, and it is satisfactory to learn that, in his experience, it now rarely occurs that a chronic glaucoma is mistaken for advancing cataract, and the patient advised to do nothing until the vision is gone. It is now also comparatively rarely that atropine is responsible for the onset of glaucoma. In repeating the usual warning against the use of atropine in the old and in eyes with a glaucomatous tendency, he advises, for purposes of ophthalmoscopic examination, the use of homatropine, but in a case quoted in a later part of his paper, the employment of homatropine in this way brought on a rise of tension, which required sclerotomy, and ultimately iridectomy, for its reduction.

In acute glaucoma the sudden and severe onset of head-pain and vomiting, and in chronic glaucoma the intermittent headache and gastric disturbance, as well as the absence of external evidences of eye trouble at the time of inspection, may deceive the practitioner, and thus allow the eye to suffer irreparable injury.

Coming to the mistakes of the specialist, Haab says it is not uncommon for the oculist to attach a diagnosis of grey atrophy of the optic nerve to a case of chronic simple glaucoma. Several cases are quoted to illustrate this. As safeguards against such an error, he advises repeated examination of the tension at different times of the day, careful fundus examination by the *direct* method, and investigation of the field of vision, especially by the method of Bjerrum. If the diagnosis is still in doubt, it is wiser to treat with miotics than to pursue an expectant line of treatment. Iridectomy in the advanced stages of simple glaucoma may do harm, but a persevering and intelligent employment of miotics and sclerotomy may be of the greatest service. We are warned against the mistake of accepting a diagnosis of interstitial keratitis in children under four years of age without excluding glaucoma.

Treatment ought to be as persistent as the disease itself. Sclerotomy may be used as an adjunct to iridectomy, but in some cases it should be the only operative procedure, notably in the glaucoma of children in which iridectomy often has disastrous results. Above all, he insists strongly on the value of the long-continued use (under periodical observation) of miotics, even in eyes which have been submitted to operation. He has thus employed pilocarpin for periods of twenty years and over without producing conjunctivitis or other untoward result. A. J. BALLANTYNE.

Condylomatous and Gummatous Lesions of the Ciliary Body. (Delle alterazioni condilomatose e gommose del corpo ciliare.) By Dr. A. DE LIETO VOLLARO. Naples: 1908.

Dr. de Lieto Vollaro, after an historical *aperçu* of the question, gives details of seven cases of condyloma or gumma of the ciliary body published by him in 1900, and describes all analogous cases, seventy-one in number, that he has found in the literature. This rich material allows him to formulate important conclusions with regard to the ætiology, symptomology, diagnosis, result, and treatment of these important lesions of the eyeball.

His conclusions are essentially as follows.—Papules (condylomata) of the ciliary body represent a rare ocular manifestation of acquired syphilis and an even rarer manifestation of hereditary syphilis. While true gummata of the iris are very rare (the so-called "gummatous iritis" is almost always merely a papular or condylomatous iritis), the ciliary body presents more often true gummata, but at a recent period of infection, as a sign of precocious *tertiarisme* in cases of galloping or malignant syphilis. From the standpoint of the symptomology, of evolution, and of termination, as well as from that of the pathological anatomy, these precocious gummata do not differ at all from the late gummata: at most, it can be said that their evolution is more rapid and malignant, and that they nearly always entail atrophy of the globe.

The diagnosis of a gumma of the ciliary body in the late period of syphilis and in the hereditary disease, seldom presents any real difficulty to the ophthalmic surgeon. The differential diagnosis, however, must be made between a gumma and gummatous scleritis and episcleritis, tubercle of the uveal tract and of the sclera, melano-sarcoma of the ciliary body, and intercalary staphylomata resulting from anterior sclero-choroiditis.

The diagnosis between early gumma and simple papule or condyloma of the ciliary body is much more difficult when the lesion supervenes in the course of recent syphilis, and in the absence of other signs of precocious *tertiarisme* or of grave syphilis. In these cases the results only may clear up the diagnosis, since papules or condylomata react, in general, very quickly to treatment, and get well without leaving grave damage, while veritable precocious gummata do not benefit rapidly from specific treatment, rapidly undergo caseation, provoke perforation of the eyeball in proximity to the sclero-corneal limbus, or the formation of necrotic masses of exudation beneath the bulbar conjunctiva. Complete loss of sight and atrophy of the globe are, with some rare exceptions, the definitive issue of such cases. The prognosis of gummata is therefore extremely bad, especially as it is not uncommon for intolerable pain to necessitate enucleation of the eyeball even before the latter has undergone atrophy.

Admitting the frequency of precocious gummata as compared with papules or condylomata, the treatment to pursue when faced with a manifestation of this kind in the course of recent syphilis is to associate with intensive mercurial treatment, iodine in doses as large as can be borne by the individual patient.

A. ANTONELLI.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE ANGLE NOTATION OF CYLINDRICAL LENSES.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

We opticians owe you a debt of gratitude for calling attention in the October number of THE OPHTHALMOSCOPE to the question of angle notation for cylindrical lenses, and especially for your appreciative notice of the work of the Standards Committee of the Optical Society.

The advantages that would attach to the general acceptance of a standard of notation are sufficiently obvious, and should appeal to the surgeon as well as to the optician. To the latter it is an essential that the notation adopted should involve the least amount of writing; the multiplicity of entries for each pair of spectacles demanded by the ordinary routine of an optician's shop and workroom makes it inconvenient to employ a diagram. The direction of the axis must be expressible by a simple figure with the ordinary symbol for degrees. This simplicity in indicating the axis of the cylinder should also appeal to the surgeon; though, from his point of view, no doubt the most weighty consideration is to banish all possibility of mis-interpretation.

This is not so unimportant as it may seem Of course, a carefully filled diagram is absolutely safe, but a stroke diagram, unless the zero position is indicated, is often ambiguous; and in any case such a direction as "25° down and out" is unintelligible to the optician, unless he is familiar with the prescriber's methods. The words "down and out" may refer to the direction of the axis, in which case the zero position should be known; or, it may refer to the progression of the scale, and in that case it is equally capable of two solutions.

Perhaps the uncertainty as to the proper interpretation of the recommendation of the International Ophthalmological Congress, which is alluded to in the *Review*, is not altogether unfortunate. If it should give occasion for the revision of the recommendation, it may lead to the adoption of the system which is generally in use among opticians. This is the system of notation which was recommended as a standard by the Committee of the Optical Society, and it may possibly be of interest to recall some of the reasons which influenced the decision of that Committee. The choice practically lay between two widely used systems of notation: (A) that based on the mathematical convention, which was already used by many surgeons in England, by more in America, and by practically all opticians in both countries; and (B) the system of nasal zeros with a continuing scale on the lower half of the circle. This is the system perhaps in most common use among surgeons in England.

The advantages possessed by the first system (A) would appear to be: (1) its more general use; (2) the fact that direction can be expressed by a figure without reference to the eye (R or L); (3) in instruments, such as the ophthalmometer, designed for use with either eye, a single axis-scale only is necessary.

These advantages are peculiar to system A. On the other hand, it may be urged on behalf of system B: (1) that it is in more general use among surgeons; (2) in the words of the Report of the Congress, "the usually symmetrical meridians of intra-ocular astigmatism are represented by the

same number" This consideration presents, to my mind, the only favourable point in the comparison. On the other hand, it may be urged that in practice one soon learns to recognise that 10° and 170°, 60° and 120°, and so on, are corresponding positions of axis. (3) It is adduced as an advantage by the Congress that "only the number of degrees found need be noted." This is incorrect. The eye, whether R. or L., must also be indicated.

I assume that system B represents the recommendation of the International Ophthalmological Congress. It seems the only possible inference from the words of the official report. But, if Dr. Grossmann's interpretation is the correct one, (1) would cease to apply as an advantage.

With reference to the wording of the official report, I would like to suggest that "the middle line of the face in each eye" is an inexact expression, capable of differing interpretations, and that the use of the word "meridian" to indicate any direction of axis is unfortunate. Meridian is properly an adjective, and used in this connection would seem to indicate a vertical direction only. The symbols a.m. and p.m. are in general use, and everyone must have some conception of the meridian plane.

Too much importance should not be allowed to this question of a standard notation. It is always possible to the surgeon to define his axis direction exactly by means of a diagram. It is mainly for the optician and his workman, for the writer and the lecturer that a simple notation is desirable. General acceptance of any system is, I suppose, impossible. Under an Autocratic Monarchy, or perhaps with a Socialist Government, a standard might be decreed and conformity enforced, but in a free country there will always be non-conformists, and the most we can hope for is the general recognition of the standard. By multiplying standards their only object is annulled, and at least it would seem desirable that if representative bodies assume the responsibility of recommending standards they should recommend the same.

It is for this reason that I venture to hope that, if this particular recommendation of the International Ophthalmological Congress is reconsidered, due weight may be given to the fact of the general acceptance by opticians of the standard notation recommended by the Optical Society.

I am, Sir,

etc.,

W. A. DIXEY.

3, NEW BOND STREET,
LONDON, W.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR,

With reference to this question, we should like to point out how the uncertainty as to the standard set up by the Naples Congress operates in a particularly unfortunate manner in our own case, in consequence of our being the only establishment having branches in three countries. For the convenience of our patients we are constantly interchanging prescriptions between New York, Paris, and London. We are often compelled to cable prescriptions, and it will be readily understood how unfortunate it is to be unable to indicate the direction by enumerating the degree. From New York to London or Paris it is simple, because of the mathematical system adopted in the United States, but from London or Paris to New York the matter is one of great difficulty. Some time ago our Paris manager reported that he had altered fourteen trial frames to the standard for certain Continental oculists. He was greatly surprised when he was told that he had made a mistake in marking them so as to read in the upper semi-circle. His contention now is that we are wrong, and really we could not blame an assistant should a

mistake be made in reading a Paris prescription under the present circumstances. The same reasoning applies to Paris in reading our prescriptions. The only remedy seems to be to translate them in accordance with the mathematical principle, which, again, introduces possibilities of error.

Yours faithfully,

p.p. E. B. MEYROWITZ,

JOHN B. REINER,

(*London Manager.*)

1A, OLD BOND STREET, LONDON, W.,
October 15th, 1909.

A SIMPLE SUBSTITUTE FOR A ROTATING PRISM.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

I was much interested in Mr. L. L. Liebermann's letter in your last issue, in which he holds forth his claim to the inventorship of a muscle-testing chart.

The system of muscle-testing he claims has been in use in our establishment for over four years. The principle and system are exactly the same as in Mr. H. Grimsdale and Mr. Liebermann's charts, and I take exception to Mr. Liebermann claiming this method as his invention.

I am, Sir,

Yours faithfully,

A. COWAN.

(Cowan & Sons.)

50, CHURCH STREET, LIVERPOOL.
October 7th, 1909.

SIGHT TESTS IN THE MERCANTILE MARINE.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

The Board of Trade have recently issued their Report for last year on the sight tests used in the Mercantile Marine. There are two points in this Report to which I desire to draw attention. The first is that of the 13 men who failed with the wool test and were re-examined on appeal, 7 passed and 6 were rejected, that is to say, over 53 per cent. passed. The Committee of the Royal Society on Colour Vision say in their Report, page 17, with reference to the old Board of Trade tests: "Cases have been brought before the Committee's notice where a candidate who has failed at first has passed in a subsequent examination. If the test for colour blindness was fair to the candidate, and perfectly efficient, such a re-examination would be unnecessary, and passing upon re-examination would be impossible." The old Board of Trade tests did not reject this enormous percentage of normal-sighted persons.

The second point is that two additional test skeins, a yellow and a purple, have been added. This will not increase the efficiency of the test, especially as the examiners are not medical men and have no real knowledge of the subject. The only result of these additions will be that more normal-sighted men will be rejected, as well as many more of those who have slight and unimportant defects of colour perception. The special varieties of colour blindness which passed this test in its previous state will be able to pass it now, and these include many of the most dangerous varieties of colour blindness.

I am, Sir, etc.,

F. W. EDRIDGE-GREEN, M.D.

HENDON, N.W.
October 9th, 1909.

THE DIPLOSCOPE.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

I beg of you the favour of some space in your magazine in which to reply to the letter of Dr. A. Rémy, of Dijon, dated August, 1909, which appears in your issue of this month (October.)

The only point that I feel concerned to answer is the suggestion that I did not present a fair summary of his numerous writings on the diploscope in the article which I wrote for the *Ophthalmic Review*. I do not think Dr. Rémy is justified in his complaint.

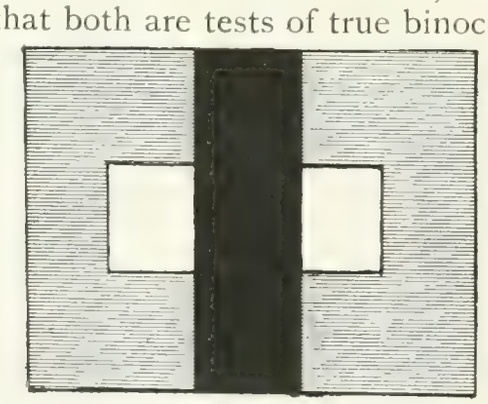
When, in the autumn of 1908, the editor of the *Ophthalmic Review* asked me to examine Dr. Rémy's papers and review them, I took great pains to investigate a very complicated series of papers. Since some points in the papers were not clear to me, I took the trouble to write to Dr. Rémy, who favoured me with still more papers.

The article I wrote is, I believe, the longest and most detailed account of the diploscope that has appeared in English. My particular offence in Dr. Rémy's eyes is that I neglected his three-letter test. On turning up this test in his first and fullest paper which he commended to my study, I find the description of it occupies only one page in his book of 68 pages. Dr. Rémy says in his letter he has described 16 experiments, I gave two of them, those which he dealt with at most length in his numerous papers, I chose them for that reason and no other. I had the pleasure of meeting Dr. Rémy at Moorfields last July ; he mentioned this matter to me then and I gave him this explanation, which appeared to satisfy him.

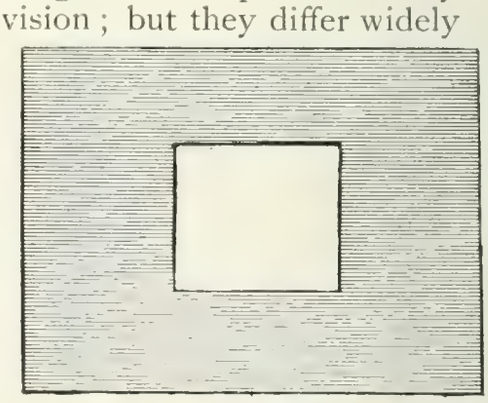
Dr. Rémy appears to deny that the construction of his diploscope is based on Javal's bar-reading test. It would seem that that part of the disc of his instrument which separates the two holes constitutes an obstruction to vision exactly equivalent to Javal's bar. This "bar" is an integral and inseparable part of the diploscope.

With the assertion of Dr. Rémy that his three-letter test and my "diaphragm test" are one and the same, I cannot agree. It is quite true they are alike in that both are tests of true binocular vision ; but they differ widely

1
Javal



2
Rémy



3
Harman

in the manner in which the test is applied. The diploscope introduces the patient to a perplexity, for he has to look with both eyes through two holes simultaneously. In the diaphragm test the patient is confronted with a screen with but one hole through which to look ; it is a condition which seems quite natural and simple to him.

A further advantage of the single-hole diaphragm test lies in the fact that it gives the surgeon a sure sign of the presence of two-eyed vision irrespective of any statement of the patient : that sign is the co-ordinate movement of the

patient's eyes as he looks from one to other area of crossed vision. A man who has one-eyed vision does not make this movement. This invaluable indication is necessarily lost in the diploscope with its two or more holes.

If I may be allowed three simple figures the evolution of these tests can be seen at a glance.

1. Javal's bar, held between the patient's eyes and the print of the test.
2. Rémy screened off part of the sides of Javal's bar and got the diploscope, two holes in a disc.
3. I cut out the bar, and got the "diaphragm test," a screen with one hole, and a test of surprising capabilities.

To whom is the credit due? When I talked with Dr. Rémy I said to him: "You, sir, are the father of the diaphragm test, for I should not have thought of it had I not read your papers." To which Dr. Rémy promptly replied: "I, too, should not have thought of the diploscope without the work of Javal."

I am, Sir, Yours faithfully,

N. BISHOP HARMAN.

108, Harley Street, London, W.
October 8th, 1909.

NOTES AND ECHOES.

Deaths.

The death is announced of Thomas Spence Meighan, senior surgeon to the Glasgow Eye Infirmary, and lecturer in ophthalmology to Anderson's College, Glasgow. The circumstances of his death were somewhat tragic. Meighan had just left the Infirmary after a busy afternoon's operative work, when he was smitten down with apoplexy while still not more than a hundred yards from the institution. He was carried to a home, and died the same day, October 15th. Meighan graduated M.B. and C.M. at the University of Glasgow in 1870, and proceeded to the degree of M.D. four years later. In 1897 he became a Fellow of the Glasgow Faculty. Meighan was a member of the Ophthalmological Society of the United Kingdom, and his principal published contributions to the literature of his speciality included the description of a new operation for symblepharon (1888) and of cases of optic neuritis of intra-cranial origin (1893). Dr. Meighan, who was a widower, leaves a family of boys to mourn his loss.

The following appreciation has been furnished by Dr. Meighan's colleague, Dr. Ernest Thomson:—

"We much regret to announce the death—tragic in its suddenness—of Thomas Spence Meighan, at the age of 60 years. Surgeon senior in office to the Glasgow Eye Infirmary, a hard worker all his life, he has died in harness. On the afternoon of October 15th he was engaged in the operating room of the Infirmary, doing as good work as he had ever done. A few minutes after leaving the institution he was seen to be taken ill. Doctors and friends were quickly with him and conveyed him to a nursing home. He died later in the evening. The cause of death is stated to be apoplexy, Meighan had been connected with the Glasgow Eye Infirmary as Assistant Surgeon and Surgeon almost ever since his graduation in 1870, and for a number of years he had been Lecturer on Ophthalmology in Anderson's College Medical School. About three years ago he was appointed a Medical Referee under the Workmen's Compensation Act for the counties of Lanark and Ayr. He was a good all-round man, not only as an oculist, but as a general practitioner also for he never really said "good-bye" to general practice.

But as an operator upon the eye he was superb. His manual dexterity and lightness of touch were well-nigh perfect, and in his ability to do exactly what he set out to do he had a gift which is possessed by comparatively few. His skill will be remembered as a standard of perfection by all those who have had the pleasure of assisting him in the operating room."

We regret to announce the death of George Culver Harlan, M.D., of Philadelphia, on September 25th as the result of a fractured spine caused by a fall from his horse three days previously. He was 75 years of age. At the beginning of the Civil War in 1861 Harlan served as assistant surgeon in the United States Navy, and upon his resignation of that post, was appointed surgeon to the Eleventh Pennsylvania Calvary. The war ended, Harlan settled down in Philadelphia, where he devoted himself to ophthalmology and otology. He served forty years as ophthalmologist to the Pennsylvania Hospital, and resigned that post but a few months ago. He was also consulting surgeon to Wills Eye Hospital, and consulting ophthalmologist to the Institution for the Blind. Harlan was a member of the American Ophthalmological Society, and a Fellow of the College of Physicians of Philadelphia.

Dr. Krienes, once *privat-dozent* of ophthalmology in the University of Breslau, and well-known for his monograph on hemeralopia, is dead.

The deaths are also announced of William C. Krauss, consulting neurologist to the Buffalo Eye and Ear Infirmary, who died, aged 64 years, on September 21st, at New York, and of George Colburn Clement, surgeon and ophthalmologist to Hale Hospital, who died, aged 54 years, on August 27th last. G. Colburn Clement, who had practised as an ophthalmic surgeon at Havenhill, Massa., since 1880, died, aged 54 years, on August 27th.

* * * *

Appointments.

D. C. Lloyd-Owen, J.P., has been appointed consulting surgeon to the British Ophthalmic Hospital, at Jerusalem, *vice* R. Brudenell Carter, resigned. This famous institution, as most readers are doubtless aware, is maintained by the Order of St. John of Jerusalem in England.

Herbert Emmerson has been appointed honorary ophthalmic surgeon to the Chesterfield and North Derbyshire Hospital.

Thomson Henderson, well-known for his researches into the histology of glaucoma, has been appointed surgeon to the Nottingham and Midland Eye Infirmary at Nottingham, the remaining members of the staff of which include Edward Laws and Colonel H. Herbert.

C. A. S. Dalgleish has been appointed honorary surgeon to the Sunderland and County Durham Eye Infirmary at Sunderland, *vice* T. F. Hopgood, deceased.

H. Neville Crowe has been appointed Assistant Surgeon to the Ophthalmic Hospital, Worcester.

The following appointments have been made at the Royal Eye Hospital, Southwark, S.E. : James Collier, honorary physician ; W. M. Bergin, honorary assistant surgeon ; Sir W. J. Collins, senior honorary surgeon, *vice* M. McHardy, resigned. Malcolm McHardy has been appointed honorary consulting surgeon to the hospital.

Dr. Stanculeanu has been appointed professor of ophthalmology in the University of Bucharest, in succession to Manolescu, resigned.

Josef Imre has been appointed professor of ophthalmology in Klausenberg, in succession to Professor Hoor, who has assumed control of the II Eye Klinik in Budapest.

Eugen v. Hippel has succeeded to Schmidt-Rimpler in Halle.

Dr. W. Reis has been appointed professor of ophthalmology in Bonn, Germany.

Dr. Hethey, Superintendent of the Royal University Eye Klinik in Berlin, has received the title of professor.

Dr. Lodato, of Sienna, has been called to Palermo as extraordinary professor of ophthalmology.

Dr. Fleischer, of Tubingen, has been nominated extraordinary professor of ophthalmology.

Drs. Adam Bednarski and Adam Szulislawski, *privat-dozenten* of ophthalmology, have been nominated professors in the University of Lemberg.

* * * *

The late Dr. Hopgood's Will.

DR. T. F. HOPGOOD, of Sunderland, who was virtually the founder of the Sunderland and County Durham Eye Infirmary, has left estate valued at £18,727.

* * * *

Presentation.

INTERESTING presentations were made a week or so ago to Mr. Chas. Lakin, Mayor of Leicester, and to Dr. Robert W. W. Henry, from the blind people of the town and the Council of the Wycliffe Society for Helping the Blind. They were in recognition of many years of honorary service to the institution mentioned, Mr. Lakin as physician, and Dr. Henry as ophthalmic surgeon.

* * * *

The late Dr. Bell Taylor.

THE late Dr. Bell Taylor's love for dumb animals is shown by a provision made in his will, which directs his trustees to keep all his animals in comfort, properly housed and fed, so long as they live, and to set aside sufficient part of his property, which is valued at nearly £120,000, to provide for this. Included among the animal pensioners are four horses, one of which was once ridden by Lord Roberts at a review. The Nottingham oculist for several years visited the sands at Scarborough, and, picking out the horse he considered to be in the worst condition, sent it by train to Nottingham, where he kept it throughout the winter, returning it just prior to the following season to the rightful owner, free of every expense.

* * * *

Modern Remedies.

A REPORT upon the revision of the United States Pharmacopœia has been recently presented by a committee of the American Medical Association. The committee was appointed "to examine into the merits of various remedies alleged to be of value in ocular diseases," and it consisted of Casey A. Wood, A. Edward Davis, Edward Jackson, and T. B. Schneideman. The simple plan of the referendum was adopted. Six drugs were submitted to the vote of the members of the section, with the following results :—

Adrenalin hydrochloride	552 votes.
Dionin	538 votes.
Argyrol	474 votes.
Fluorescein	407 votes.
Protargol	285 votes.
Holocain hydrochloride	257 votes.

The committee further advised that some remedies official in the Pharmacopœia of 1900 might be discarded without material loss to ophthalmology. These discredited or obsolete agents included the *Argenti nitras mitigatus* (so-called "mitigated stick,") oleate of cocain, oleate of atropin, the salicylate of physostigmin, the extract of scopola, and the extract of stramonium. Lastly, the question was raised by the committee, but left unsolved, whether homatropin hydrochloride offered any advantages over the official homatropin hydrobromide.

* * * *

Bequest to the Blind. THE entire residuary estate of Miss Edith Rebecca Lord has been devoted to the interests of the blind. Pensions of 10s. a week are to be paid to as many blind adults in England as the income will allow. The pensions are saddled with certain conditions. For instance, the recipients must be of good character, and must never have begged upon the streets. They must, moreover, have become blind after twentieth year, and must be over thirty-five years of age. An annual concert and dinner, to be known as the "Norman Lord Dinner," is to be provided from the interest of a sum of £1,000 vested in Gardiner's Trust for the Blind.

* * * *

The Eyes of Hebrews. A CORRESPONDENT has favoured us with a copy of *The Jewish Journal* of recent date, together with a translation (*sic*) of a marked paragraph, or it may be advertisement (our knowledge of Hebrew is inadequate to say which), headed "Free Help for Poor Jews," which runs as follows:—

"Who can't see well, who are short-sighted and have bad vision. The LONDON COUNTY COUNCIL begs to inform the public the following: we warn you against the great risk you are taking and also your children who wear glasses and those who are prescribed in various places where eyes are examined and from Eye Specialists who are not English doctors, from chemists or other people excepting truly qualified doctors, when you require your child to be treated by a true doctor. He always prescribes salve or drops which you shall use at home, it is very important that you should do as the doctor instructs or as it is written on the box or bottle. If you don't do so and you go a second time to see the doctor, he cannot give you the right glasses satisfactory, and waste of time is the cause. Therefore, so be careful and use the drops as ordered and go to the right doctor and to help the poor Jews who suffer from bad sight, so that they can guard against the London County Council, that a doctor from the Eye Hospital shall fit glasses free to the poor Jews every day from 9 to 11, and 4 to 7, except Wednesdays and Saturdays, The Jewish Dispensary, 195 Whitechapel Road."

* * * *

Tuberculosis of the Eye. A LARGE and representative committee of ophthalmic surgeons has been appointed by the American Medical Association to collect evidence bearing upon the relationship between tuberculosis and diseases of the eye. It is suggested that the following affections may be profitably studied from the tuberculous point of view: blepharitis, chalazion, follicular conjunctivitis, phlyctenular diseases, scrofulous pannus, non-syphilitic interstitial keratitis, episcleritis, scleritis, sclerosing keratitis, chronic and relapsing iritis when the ætiology is obscure, uveitis with hyalitis, and choroiditis. A schedule has been prepared by the committee to be used in the examination of suspicious cases. This includes (1) a thorough examination of nose, throat, lungs, joints, etc.; (2) a careful statement of the condition of the affected eye; (3) examination with tuberculin (a. cutaneous test, b. conjunctival test). If both the conjunctival and the cutaneous test yield negative results, they should be tried a second time after an interval of three or four days. If they still remain negative, and there is reason to suspect that the case from its clinical appearance is of tuberculous origin, then c. the subcutaneous test with Koch's old tuberculin, should be adopted. It is finally advised that all who take part in this collective investigation should employ in their tests tuberculin from one maker only, whose name is appended to the report.

* * * *

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. VII.—No. 12.] *DECEMBER 1, 1909.* [TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

A PRELIMINARY NOTE ON A NEW OPERATIVE PROCEDURE FOR THE ESTABLISHMENT OF A FILTERING CICATRIX IN THE TREATMENT OF GLAUCOMA.

MAJOR R. H. ELLIOT, M.D., F.R.C.S.,

THE present paper is intended merely as an advance note, and nothing else. The operation discussed has been in the writer's mind for a long time, but the opportunity to perform it a number of times did not occur until after his return from leave four months ago. In the last four months he has performed it fifty times, and has thus learnt something of its possibilities.

The underlying assumption is that Herbert and Lagrange have established their contentions (1) that it is possible to form a permanent filtering cicatrix between the anterior chamber and the subconjunctival space, and (2) that the establishment of such a condition permanently reduces a raised intra-ocular tension. The writer has performed both Herbert's and Lagrange's operation a number of times in the past, and has satisfied himself of the soundness of the position taken up above. This note is intended for those only who

Herbert's operation is extremely complicated. The writer has had the good fortune to have every step of it demonstrated to him by its author, and has seen some of the excellent results Herbert has obtained from it. He has, moreover, performed it a number of times himself, but he still thinks it a difficult and complicated procedure.

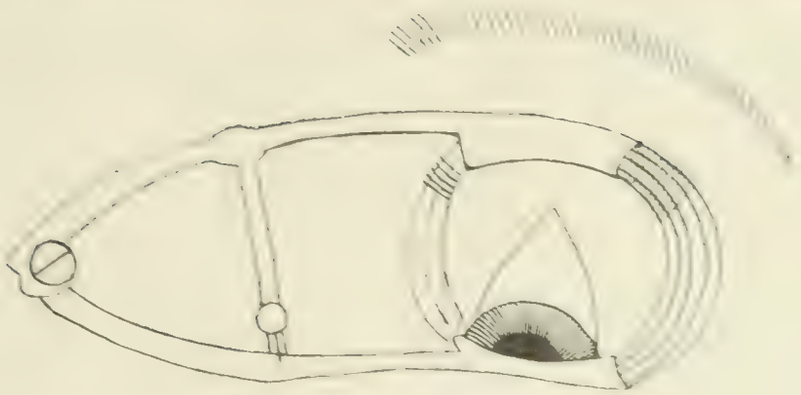
Lagrange's operation is easier, but is not, in the writer's experience, and apparently in that of others, free from risk. The scleral section has to be made on *an opened eye* and often on *an inflamed eye*. It is not easy under these circumstances to graduate the exact amount of scleral tissue removed, and vitreous-escape is an ever-impending danger.

Whilst acknowledging to these workers his indebtedness for the foundation of the ideas here set forth, the writer claims that the following simple operation enables a surgeon to attain all Herbert and Lagrange aim at by the aid of an operation which is within the reach even of a tyro. It consists essentially in raising a large conjunctival flap, and then removing a disc of sclerotic tissue, close up to the limbus, by means of a corneal trephine. The anterior chamber is thus entered with ease and safety, and an aqueduct for permanent filtration provided.

Steps of the Operation.—The operation is performed under the influence of cocain and adrenalin. If there is much pain or congestion, or if the patient appears likely to be unruly, a hypodermic of morphin is given twenty minutes beforehand.

The patient is directed to look down towards his feet, and a large triangular flap of conjunctiva is dissected up from above or from below the cornea in the vertical meridian, the attached base of the triangle lying at the corneo-scleral margin. Care is taken to dissect the flap right up to this margin. It is then turned down over the cornea.

The spot selected for the trephining should be as close to the limbus as possible, and should be prepared, if necessary, by scraping down with the scissor points to the sclerotic coat, to ensure that no subconjunctival tissue is left, since otherwise this will catch in the trephine and tend to draw the flap into



FIRST STAGE OF OPERATION.
Showing the site of the triangular flap when made across the cornea.

the latter as it is working. If the trephine is sharp, however, this is not a serious danger in any case. An assistant draws the flap on to the cornea and out of the way with a small sterilised wool sponge mounted on a thin stick. This serves the double purpose of protecting the flap and of sponging blood away during the trephining. The guard of the trephine is set at such a depth as just to allow penetration of the sclerotic coat, and a disc is slowly cut out. From time to time one stops to wipe away blood. When the anterior chamber is reached, one sees the aqueous welling up beside the trephine. A peculiar and characteristic sucking feeling indicates to the operator that he has penetrated the globe. This is quite easily appreciated after a little practice.

SECOND STAGE OF OPERATION.
(a) Raw surface left by raising the conjunctival flap.
(b) Trephine hole.
(c) Flap of conjunctiva turned down over the cornea.

Several courses are now open to the operator.—(1) He may leave the disc *in situ* in imitation of Herbert's method, or (2) he may cut out the disc of sclerotic, completing the operation with the trephine, or (3) he may complete the removal of the disc with a fine pair of forceps and a sharp pair of scissors. Again, if the iris does not present in the wound, he may keep his operation simple, or he may combine an iridectomy with his sclerectomy by cutting off the base of the iris in the area of the disc-hole. He may by the selection of the size of his trephine, graduate his sclerotic incision to the needs of the case, as judged in advance by the amount of tension existing. Our trephine has had a diameter of 2 mm.

Except in a very few of his earliest cases the writer has invariably removed the trephined disc completely. It is too early to say whether this is always necessary.

In two cases out of the 50 it was subsequently necessary to re-open the wound to remove a bulging portion of iris, which had not presented in the disc-hole at the time of the operation.

In two other cases there was slight displacement of the pupil towards the trephine hole, whilst in the remaining forty-six the iris remained in good position, as shown by the pupil keeping central. Eserine was instilled at the close of each operation, and repeated later when necessary.

Iridectomy was performed in twenty-one out of fifty cases. In most of these only a tiny peripheral button of iris was removed, and the resulting coloboma was so small and so peripheral that it could only be subsequently found by careful examination with oblique illumination. Yet it has met all requirements.

The anterior chamber had reformed on the day following operation in thirty-seven cases out of the fifty; five more closed on the next day; and the remaining eight were spread over the period from the 4th to the 12th days.

Results.—The lowering of tension has been as marked and as unmistakable as that obtained by a successful Lagrange or Herbert operation. In no case has the operation failed to relieve tension.

The sub-conjunctival filtration has been very free in all cases and has remained so in those we have been able to follow up, although, of course, it has eventually in these latter become much less free than it was just after operation. This diminution of filtration, corresponding with a rise from the very low tension immediately succeeding operation, is naturally both inevitable and desirable.

In about half of the number of cases the flap was made below instead of above the cornea. Provided the iridectomy, if performed, is small and hidden under the edge of the sclerotic (as it usually is), the site of the trephining does not matter; nor is it of any consequence in the nearly blind, who constitute a large percentage of cases operated on in Madras. On the other hand, it is obviously much easier to operate on the lower than on the upper segment of the eye in nervous patients, who, involuntarily look steadily upwards throughout the procedure. If an anæsthetic be given, the question does not arise. With us in Madras it is often a question of time; for with a number of operations to do it is a great gain to dispense with a general anæsthetic as often as possible.

The fact that we have not had a single septic accident in the series of fifty cases shows that we do not risk much by boldly throwing down a conjunctival flap and working with an open view of the field of operation. Each case is carefully prepared for operation by the procedure detailed in a paper read last year by the writer before the Ophthalmological Society of the United Kingdom.*

The one danger met with has been that of making the trepine hole too far out and thus tapping the suprachoroidal space instead of the anterior chamber. If this is done, the anterior chamber does not empty, the tension is not well lowered, and if any effort is made to excise the bulging uveal coat, a vitreous loss will occur. This happened in three of the earlier cases, before the great importance of "hugging the limbus" was appreciated. It has not occurred at all in the last thirty cases.

To some the publication of the present paper may seem premature. The ideas embodied in it have been so long before the writer's mind that he has wondered others have not anticipated him. He is convinced that it is founded on sound principles, and it is obviously very easy to perform the operation. He hopes that those who have been deterred from attempting the more difficult procedures of other surgeons will try this. Its *technique* is within the reach of all. Operative skill can scarcely be said to be required.

* See *Trans. Ophthalmological Society U.K.* Vol. XXIX, 1909, p. 62.

SOME CASES DEMONSTRATING THE EXISTENCE OF THE FILTERING CICATRIX.

BY

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I.M.S.

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IN publishing the following notes, I desire to confine myself to one issue and one alone. Lagrange and Herbert have maintained that by operative measures it is possible to obtain scars permeable to fluid, and thus to establish a process of filtration between the anterior chamber and the subconjunctival space. Thomson Henderson has given the negative direct to these views. Ernest Thomson has reviewed the rival expressions of opinion, and asked for further evidence, very rightly insisting on the need for "time" to be given the cases. I cannot find that Henderson has insisted on the *impassable cicatrices* being iris-free, but I have collected only such cases as from their appearances appear so to be. Ernest Thomson's article (pp. 84 to 88 of THE OPHTHALMOSCOPE for 1908) gives all the references, and so it seems unnecessary to recapitulate them.

It would not be difficult to collect more similar cases in Madras. These four, amongst others, have appeared at this Hospital during the last four months since my return from leave. My contention is that it is most certainly possible to obtain filtering scars. I accept the wider definition of Lagrange, and include those cases in which one or more fistulous openings can be seen opening into the subconjunctival space.

The notes may be left to speak for themselves. The last three should certainly satisfy Thomson's demand for time. It is of interest that the four cases were operated on by as many different surgeons, and that in one case only (the first) is there any inference that a filtering scar was aimed at. If permanent filtration can be obtained at times accidentally, there should be little difficulty in obtaining it regularly, if we first study the condition necessary to secure the filtering cicatrix. This Herbert and Lagrange have done.

CASE 1.—Soshiah, a male Hindu, æt. 63, was admitted to the Government Ophthalmic Hospital, Madras, on 26th April, 1909, suffering from an attack of acute glaucoma, secondary to the action of a cortico-nuclear senile cataract. He was actively treated with leeches, purgation, the hypodermic use of morphine, the instillation of eserine, etc., and improved sufficiently to enable Lagrange's operation to be performed by Captain H. Kirkpatrick on 8th May, 1909. A broad iridectomy was combined with the sclerectomy. The patient was discharged greatly relieved on 31st May, 1909, and returned on 29th July, 1909, for the removal of the cataract. I then found that the condition was as follows: the dark mark representing the sclerectomy could be clearly seen; it was nearly 1 mm. broad, and about 6 mm. long; over it there was a wide patch of sub-conjunctival œdema, into which a probe sunk, leaving a depression which was clearly visible for some time. The remainder of the conjunctival surface was quite free from any similar condition of œdema. The tension was normal, and the V, hand-movement, was all one could expect from so dense a cataract. The cataract was removed on 2nd August, 1909, and the after-course of the case has been uneventful. Definite fistula could not be seen.

It will be observed that a well-marked filtering cicatrix was present 86 days after the original operation; moreover, it had every appearance of being free and permanent. On massage of the eyeball the superjacent fluid œdema increased in amount, showing clearly that its source was from within the globe, a deduction which was confirmed by the simultaneous lowering of intraocular pressure.

CASE 2.—A. H. T. Mulk, a male Persian, æt. 38, of no occupation, was admitted to the Government Ophthalmic Hospital, Madras, for the sequelæ of granular ophthalmia.

History.—He states that 3½ years ago he had an iridectomy performed on each eye by a Persian doctor in Teheran.

Present condition.—The patient shows both conjunctival and corneal evidence of long-standing granular ophthalmia in both eyes.

L. E.—There is the coloboma of a clean iridectomy directed upwards. Opposite this and close to the limbus is a distinct conjunctival bleb, superjacent to a dark spot, which is evidently a fistula opening subconjunctivally. On manipulation, this bleb becomes very distinct, and the surrounding cornea becomes markedly œdematous; whereas before manipulation the conjunctiva of the area is nearly flat;

there is, however, always a slight œdema of the conjunctiva around the fistula, as shown by the groove left on pressing on it with a spud or probe. The iris does not appear to be involved in the cicatrix. It is not clear why the iridectomy was performed in the first instance. Corneal opacities have reduced the V. to fingers at 4 m. Tension is below normal.

R.E.—There is the coloboma of an upward iridectomy, with some slight œdema of the conjunctiva above it. The condition is detectable but not marked. Tension is rather low, and V. fingers at 6 m.

Case 3.—S. Morton, æt. 70, a male Eurasian of no occupation, admitted to the Government Ophthalmic Hospital, Madras, on 16th September, 1909, for observation.

History.—He had been operated on for glaucoma 7½ years ago; a broad, upward iridectomy having been performed in this Hospital by myself on 8th February, 1902.

Present condition.—There is a key-hole pupil; the original pupil is central, and the sides of the coloboma are steep; there is no entanglement of the iris in the wound. Immediately above the limbus, opposite the coloboma, is an elevated swelling, measuring 6 mm. horizontally, 3·5 mm. vertically, and 1 mm. in depth. In this are to be seen slightly darker areas, through which filtration is evidently taking place. The blade of a spud or a probe can be buried in the œdema of the infiltrated conjunctival patch. After manipulation, the œdema becomes more marked, and the tension of the eye, which is low at any time, becomes distinctly lower; the latter observation has been confirmed by readings with Maklakoff's tonometer. Vision has been slowly failing during the last year, and is now reduced to hand-movements; this is readily accounted for by the steady development of a lenticular opacity in the eye.

Case 4.—J. Macfarlane, æt. 82, a male Eurasian pensioner of the H.E.I.C.S.

History.—He was operated on for cataract, left eye, by Lieut.-Colonel T. H. Pope, 10 years ago, in the Government Ophthalmic Hospital, Madras; the combined operation was performed, and all went well. He has had no subsequent operation on the eye.

Present Condition.—There is a clean upward coloboma of the iris in the left eye; the eye is aphakic. There is a very distinct patch of localised sub-conjunctival œdema immediately above the coloboma. This patch measures about 13 mm. horizontally, by 4.5 mm. vertically, and about 1 mm. in depth. It comes right down to the limbus. Close to the mid-vertical meridian are two minute dark spots, and another similar spot can be seen to outer side of these (at about one o'clock). These are evidently tiny fistulous openings; all of them are situate just behind the limbus and they evidently lie in the course of the original incision. The pupil is nearly central; the edges of the coloboma are steep. Vision $\frac{6}{18}$. Tension of eye normal. The conjunctival patch of œdema can be distinctly increased by manipulation of the eye, but at any time, even without manipulation, it is quite obvious to the naked vision; it can be effectually demonstrated by pressing a spud or probe over this filtering area, when a deep pit is easily made, which lasts some time.

GRAPHIC RECORDS OF NYSTAGMUS.*

BY

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During the last few years much attention has been bestowed upon nystagmus by otologists. Nystagmus, in fact, constitutes a very important symptom in affections of the internal ear. A fundamental work dealing with the subject is that of Barany. The Belgian Society of Otology selected as the subject for discussion in 1909 "How shall we investigate the Vestibular Apparatus of the Ear," and the openers, Drs. Buys, and Hennebert, consecrate the greater part of their *mémoire* to the study of nystagmus.

Vestibular nystagmus is not always easy to recognize. Barany insists upon the precautions that should be taken. The eye is illuminated by means of a frontal mirror. One approaches as closely as possible. A finger placed at 25 or 50 cm. is the object of fixation. Should examination in that position fail to yield the expected result, the eyes are placed in abduction. It is easy to understand that if the nystagmus itself is difficult to recognize, it becomes more and more difficult still to appreciate the details of the oscillations, their frequency, their exact direction, and their amplitude, absolute and relative.

We shall not be surprised to hear, therefore, that latterly attempts have been made to register nystagmus by means of special instruments, which allow the study of this phenomenon to be pushed farther than was formerly possible. Nystagmography will do for the eye what sphygmography has done for the pulse.

* A communication made to the International Medical Congress at Budapest, August, 1909.

FIG. 1

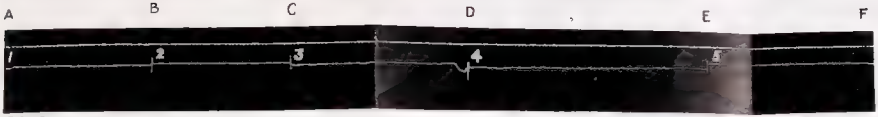

FIG. 6

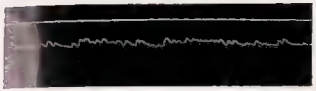

FIG. 5

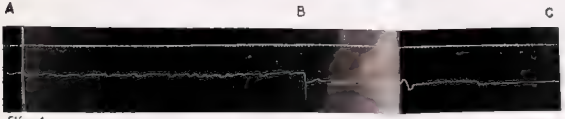

FIG. 4

FIG. 2

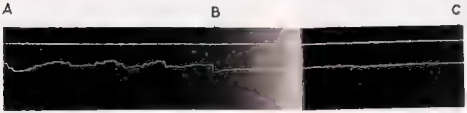

FIG. 3

Already, in 1878, Rählmann represented the different varieties of nystagmus by records. But his figures were not taken from subjects suffering from nystagmus, and were constructed merely to illustrate the various forms of nystagmus. They were, in point of fact, simple schemata, and not graphic representations.

The first work on nystagmography, which was due to Wojatschek, made its appearance in the year 1908. The apparatus employed by this author was known as the "photonystagmograph." It consisted essentially of a small mirror applied over the closed eye, reflecting a Nernst lamp contained in a receptacle furnished with a vertical slit. The tracing of the reflected light was collected upon an inscribing drum (*tambour*), furnished with sensitive paper, and enclosed in a cylinder provided with a horizontal opening. Horizontal nystagmus could be noted by these means, but rotatory nystagmus escaped the record.

One of the present writers (Buys) has recently devised a more simple apparatus, which allows tracings to be taken whether the subject be at rest or moving, and whether he be standing, sitting, or lying down. The apparatus essentially consists of *statif*, monocular or binocular, according as we wish to register the movements of one eye or of both eyes simultaneously. The *statif* bears a cupule, of shape and capacity according to the case. There is an oval cupule which measures 10 mm. by 14 mm., and two circular cupules of 10 mm. and of 14 mm. diameter respectively. The cupule, closed by a fine membrane of gold-beater's skin, is articulated upon a mobile arm. It may thus be displaced horizontally or obliquely in such a way as to be applied at will to all parts of the eyeball.

The relations between the globe and the membrane may be regulated to a nicety by means of a couple of pressure-screws. The apparatus is fastened to the head by an elastic band. The cupule is connected with a writing apparatus, provided with one or two stylets according to the case, by means of a caoutchouc tube.

Care must be taken that the nystagmograph does not bear upon the osseous wall of the orbit.

It may be stated at once that the records obtained by the instrument devised by Wojatschek and that of Buys present a distinct likeness.

Accompanying this communication are some records that will repay inspection.

The apparatus having been devised for the study of vestibular nystagmus, that condition naturally occupied our first attention.

Figure I represents nystagmus in a normal subject, turning the head successively to the left and right. There is no need to insist upon the point that simple rotation of the head suffices to make nystagmic movements appear. The nystagmograph was applied to the nasal part of the right eye.

From A to B, the subject was immobile. The abrupt depressions correspond to the blinkings of the orbicularis muscle. The subject then turns his head about 125 degrees ; the beginning of each movement is shown upon the tracing by the letters G and D (left and right) according to the direction. The nystagmic oscillations are shown very clearly. The rotatory movement of the head is accomplished in about 2 seconds, and it allows of five or six nystagmic jerks.

Every oscillation shows itself on the record by an ascending and a descending line, of unequal length, without a rest (*plateau*).

The instrument being arranged as indicated before, when the right eyeball is turned to the left, the pressure brought to bear upon the membrane causes the style to become raised. The reverse comes about if the right eyeball is turned towards the right. Thus, we see on the tracing that in rotation

of the head towards the left there is produced an abrupt movement of the eye towards the left, followed at once by a slow movement towards the right (figure I, B to C). When the head is turned towards the right, exactly the contrary takes place.

Each oscillation lasts for about a quarter of a second.

Figure 2, taken from a patient whose labyrinth had been destroyed, appears to be equally interesting. From it we see that the nystagmic oscillations are produced in rotation towards the sound side.

But it would be to stray far from the domain of ophthalmology to enter at greater length into this form of nystagmus and its method of production.

The following tracings were made from subjects free from lesions of the ear but affected with nystagmus due to diseases of the eye.

Figure 3 is from a case of miner's nystagmus. From A to B vestibular nystagmus, as in figures 1 and 2, obtained by rotation of the head. From B to C, miner's nystagmus by elevation of the eyeballs. The oscillations are smaller and more frequent. The ascending and the descending line are comparable. Each oscillation has a duration of about one-fifth of a second; in this case there are 260 oscillations a minute. In this connection it may be noted that Panas believed that the number of oscillations did not exceed 180, Terrien could count 140, and other authors speak of 500 oscillations a minute.

One can therefore at will produce two forms of nystagmus in this miner.

The tracing shows, moreover, that no relation exists between miner's nystagmus, on the one hand, and disturbance of the internal ear, on the other, as some authors, as Peters and Trombetta, have supposed.

Figure 4 relates to a woman, aged 68 years, blind for several years from complete double cataract. The tracing is taken from the right eye from A to B; the left eye is open; from B to C it is closed. During the opening of the eye we see somewhat irregular and intermittent oscillations, although the lines of ascent and descent are in general similar, and there is often a summit, a little *plateau*, of which something more will be said later. When the eyes are closed, the oscillations become rarer at first and then disappear completely.

Figure 5 is taken from a girl of 14 years, whose right eye had been enucleated and whose left eye was the seat of a large leucoma adherens, with sight which did not exceed one-tenth. The nystagmus is irregular, but permanent. The lines of ascent and descent have different velocities, but the difference is much less pronounced than in the figure which follows.

Figure 6 is from a male, aged 16 years, affected with compound hyperopic astigmatism. With 7 D. spherical combined with plus 2 D. cylindrical axis 105°, the acuity of each eye reached about 5/40. The chief features of the permanent nystagmus that was present are reproduced in the tracing. We see that the oscillations are equal as regards amplitude and duration, although the lines of ascent and descent are different. Each oscillation lasts two-fifths of a second, and the slow phase lasts seven or eight times as long as the sudden phase. From A to D the nystagmograph was applied upon the nasal part of the right eye. From A to B the patient looked towards the right; the slow phase drew the eye towards the left. From B to C the patient looked straight ahead of him; the oscillations were less marked, but they were always present and were oriented as from A to B. From C to D the subject looked towards the left. The sense of the oscillations is inverse. This time it is the sudden phase which draws the eye towards the left.

From D to F the instrument was applied over the nasal part of the left eye. The eye is looking to the right from D to E; the sudden movement takes place towards the right; from E to F the eye looks towards the left; the sudden movement takes place towards the left.

In this case the nystagmic oscillations of the two eyes are associated. The oscillations vary in the sense of occurring to the right and to the left of the middle line. They diminish in amplitude on approaching this line without it being possible to determine exactly the dead point (*le point mort*).

No useful purpose would be served by demonstrating other tracings. Further details will be given in a later communication, where we shall publish tracings from every known species of nystagmus. Some general considerations, however, may be allowed to us. What is the definition of nystagmus? Panas taught that this was a state characterised by rhythmic movements of the eyes, independent of the will. Fuchs comprehends under the name short and jerking movements of the eyes, which are repeated very rapidly and always in the same direction. Sauvineau makes of nystagmus a disturbance of the *statique oculaire*, characterised by associated movements of the eye-balls—involuntary, rhythmic, and more or less jerky.

These definitions appear satisfactory. At the same time one may object to Panas's definition that there exist cases of voluntary nystagmus (Rählmann, H. Coppez, Dodd, etc.). All the definitions, however, apply perfectly to our tracings.

We see that there exist two chief varieties of nystagmus. In the one the movements of going and coming are identical. This is undulatory nystagmus, which would be better termed "pendulatory." In the other, the movements named are of different rapidities. This is rhythmic nystagmus, which would be better termed "*nystagmus à ressort.*"

So far as we know, Rählmann was the first to establish these two varieties, of which he drew schemata. That author, who treated nystagmus particularly from the point of view of its origin, and who made of it an affection of central origin, was not specially preoccupied by the respective value of each species of nystagmus.

Uhthoff admits only undulatory nystagmus—that is to say, "the permanent oscillations of the two eyes around a fixed point." The other variety represents to him a pseudo-nystagmus; nystagmoid jerks dependent upon paresis of the muscles. We believe, with Barany, that this form of nystagmus is, however, a true nystagmus; that it responds to the definitions of the authors quoted before; and, lastly, that it need not be exclusively myopathic, as shown by our tracings. The nystagmoid jerks seen even in healthy subjects in extreme positions of the eyes are altogether different.

We cannot, therefore, accept without reserve the definition of nystagmus as given by A. Gräfe: "Nystagmus represents a trembling of the eyes, produced as a clonic spasm in a determined direction, giving rise to pendulum-like movements, independent of the action of the will, but not influencing the voluntary movements."

The foregoing definition, which agrees with Uhthoff's views, excludes rhythmic nystagmus.

The first variety, pendulatory nystagmus, is characterised by movements of equal rapidity in both senses. We do not believe that it is quite exact to add that these movements are produced from a fixed point. In figure 4 we see that the *plateau*, or period of rest, is marked, on the contrary, at one of the ends of the nystagmic path.

The second variety, *nystagmus à ressort*, is characterised by movements of unequal rapidity in the two senses. It is futile to add that in this affection these movements are produced on the same side of a fixed point. The tracings of this variety do not indicate any *plateau*, or period of rest.

The essential differential character of the two kinds of nystagmus lies in the relative rapidity of the two movements and not in the position of a point of

rest or of fixation in respect to the movements. It is otherwise with transitional forms described by Barany, where the two movements are animated by almost equal rapidity (figure 5).

Whichever variety the nystagmus belongs to, it may be sub-divided into rectilinear (vertical, horizontal, oblique) or rotatory.

We admit, with Barany, that in the case of unequal movements the nystagmus should be denominated in accordance with the more rapid movement and, if rotatory, after the most rapid phase of movement of the superior extremity of the vertical diameter of the cornea.

The researches which we have so far undertaken are not yet sufficiently advanced to allow us to determine all the ætiological factors of the two essential varieties of nystagmus, although we are in a position to state that pendulatory nystagmus is especially an optical nystagmus. When nystagmus is voluntary, it takes this form ; and the same remark applies to a large number of the cases of congenital nystagmus, such as albinism, amblyopia from high hyperopia, and opacity of the transparent media of the eye. Miner's nystagmus, also, is pendulatory, as well as the nystagmus seen in those affected with photophobia when we wish to open their eyelids (Stawsky) or in affections of the conjunctiva when one separates an eyelid lightly.

Nystagmus à ressort is met with in the physiological state only in extreme lateral deviation of the eyes. It then corresponds with the nystagmoid jerks of Uhthoff. The same remark applies to the nystagmus which accompanies certain muscular pareses. In affections of the vestibule and cerebellum, it is altogether characteristic.

In the vertigo due to stomach or uterus and in acute alcoholism, the nystagmus probably depends upon the vestibule (Barany). It is found equally in some cases of congenital amblyopia (see figure 6).

The two varieties of nystagmus may occur in affections of the central nervous system. The pendulatory form has now and then been found in tabes. One of the essential symptoms of Freidrich's hereditary ataxy is *nystagmus à ressort*. In insular sclerosis the two forms may yet be met with. Lastly, *nystagmus à ressort* may be noted in all processes the effect of which is to reduce the capacity of the posterior cerebral fossa.

In brief, in the nystagmograph we believe that we possess a really good method, whereby we are able to analyse exactly the different modalities of nystagmus and to establish a precise classification of that affection.

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CLINICAL MEMORANDA.

CATARACT EXTRACTION WITH CONJUNCTIVAL BRIDGE.

BY

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A SHORT but excellent paper by Dr. Neven Gordon Cluckie in the last number of THE OPHTHALMOSCOPE proved of special interest to me because during the month preceding I had extracted two cataracts by the semi-subconjunctival method which he describes, and for learning the Continental practice of which I was first indebted to a short note in Grimsdale and Brewerton's *Text-Book of Ophthalmic Operations*. It might almost be called the "tether" method, since the apex of the corneal flap is tethered by a long tape of conjunctiva, cut upwards by the knife in continuation of the corneal section, the knife then being withdrawn without severing the tether. In my first case, preliminary iridectomy had already been done, and the extraction under the tether was quite easy. Mr. J. H. Yearsley was present, and the rapidity of healing was remarked by us both.

The second case, one of "simple" extraction of a lens about two-thirds ripe, was in a man aged 72. The delivery of the sticky lens was somewhat slow and difficult, but was effected without loss of vitreous, and the eye healed rapidly and with a good circular pupil.

I can heartily endorse all that Dr. Cluckie has said as to the advantages of this procedure, except in eyes with unusually small palpebral fissures. It is evident that the tape must have a certain length if it is to offer no hindrance to the expulsion of the lens.

I might add that it is highly advantageous in this procedure to employ an instrument which enables the flap to be raised and the upper margin of the incision to be depressed simultaneously. A second cataract spoon, or a Taylor's vectis, enables this to be done, for it can easily be passed under the tether, and tilted until the desired elevation of the flap and depression of the sclera is sufficient. It would be better, however, if the edge which touches the sclera were made a little more rounded and smoother.

I believe that the proceeding is a distinct advance in the interests of safety. The apex of the corneal flap, which has its vitality thus partially preserved, is just the part most remote from nutritive supply when the ordinary flap is made.

SURGICAL HERNIA OF THE LACRYMAL GLAND.

BY

SYDNEY STEPHENSON.

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ON September 15th, 1909, a female child, aged ten months, was brought to the ophthalmic department of the Queen's Hospital for Children, London, on account of a small lump over the outer end of the right eyebrow, noticed by the mother for two months. It had not become larger since it was first observed.

The child was admitted, and on the following day, under chloroform, the cyst was removed. An incision, about one inch in length, was made in the outer half of the eyebrow, previously shaved. On deepening the incision, a soft, fatty-looking mass presented in the outer part of the wound. It was

flattened and somewhat lobulated. Various opinions were expressed by those present at the operation as to its nature. Upon a careful scrutiny, however, it was found to be an outlying piece of the orbital lacrymal gland. No attempt was made to remove it. The dermoid cyst was dissected out, and the skin wound was closed by several points of interrupted suture. On September 20th, the stitches were removed, and a collodion dressing was applied to the wound. Two days later the child was discharged, the wound having healed by first intention. When seen thirty-six days later, it was found that the baby could cry as well with the right as with the left eye.

A MODIFICATION OF SNELLEN'S COLOUR TYPE.

BY

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I HAVE for about a year past been making use of a very simple modification of Snellen's colour type and "Friend" test for malingering, which I think is of sufficient interest and usefulness to warrant my making a note of it.

Snellen's colour type and "Friend" test are viewed by transmitted light, but the modification I have adopted, being printed on boards, is viewed by reflected light. With Snellen's colour type the red letters only are seen through the red glass, and the green letters through the green glass of the spectacles which the person examined is wearing; whereas with the type I have been using the red letters are *not* seen when looked at through the red glass, but appear quite black when seen through the green glass, and the green letters are not seen through the green glass, but appear black when viewed through the red glass. The tints of the letters and of the background on which they are printed must be very accurately adapted to each other and to the tints of the coloured glasses through which they are viewed. Let us suppose that the word chosen for the colour type is STAINED, and that the 1st, 3rd, 5th, and 7th letters are printed in red, while the 2nd, 4th, and 6th letters are printed in green. A pair of red and green spectacles with strong prisms base out are placed before the eyes of the person to be examined. Under normal conditions when the above-mentioned type is looked at through these glasses two cards are seen, the word SAND is read on one card and the word TIE on the other card, both words appearing in strong black type. The images being crossed, a malingerer would readily fall into the trap of declaring that he could only read the card opposite his "good" eye.

Instead of the two prisms being placed base out, one strong prism base up might be used, when one card would appear above the other, and in this way might not so readily suggest to a malingerer that he was really making use of his two eyes.

I have also been making use of Snellen's ordinary distance type, but printed in alternate lines of red and green letters on a suitably-tinted background.

For examining with this type, the simple green and red spectacles without prisms are used. I think, however, that in some cases, and especially where there is a distinct heterophoria, that more comfort is experienced by the person examined, and the "trap" is equally efficient if a red or a green glass be placed before the sound eye, and before the so-called defective eye a tinted glass that will merely equalise the illumination, but will not interfere with the reading of

any of the letters. If, for instance, with a red glass before the sound eye he is able to read the red type, he must of necessity be making use of his so-called "defective" eye.

In applying this test I think it is sometimes advisable first of all to test him with the ordinary black type while wearing the coloured spectacles, lest the person being aware of tests of this nature, should bring about an artificial blindness by closing his alleged defective eye. Should he do this while being examined with the black type he will fail to see the significance of the examination, and will have his suspicions set at rest as to there being a trap set for him. When examining a case recently before the "STAINED" type a point of some interest was noted. The case was one of injury to the head with only P.L. in one eye and gradually diminishing vision in the other. The field of vision in the better eye was contracted for white, and for colours it was at the vanishing point. The fundus was almost normal in appearance. On examining the man before the coloured type, he had not the slightest difficulty in reading the word SAND or TIE with his good eye when the coloured glasses were placed before his eyes, because these words appeared in strong black type, but when the coloured glasses were removed he had the greatest difficulty in spelling out the letters of the whole word, and to do so he had to move his head so as to be looking directly towards each letter he was trying to decipher, thus demonstrating in an interesting fashion the effect of the greatly diminished field of vision for colours.

I desire to express my indebtedness to Dr. A. Maitland Ramsay for the interest he has taken in the test and for his kind criticisms.

The complete set of types and glasses can be obtained from John Trotter, 40, Gordon-Street, Glasgow.

REVIEW.

SOME OPHTHALMIC BACTERIOLOGY.

BY

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THE reports of the last year or two place the bacillus influenzæ in a much more important position in ophthalmic bacteriology than formerly. While no positive results are to hand from the inoculation of the human conjunctiva, Axenfeld wrote in 1907 that he believed it extremely probable that the bacillus influenzæ could occasionally produce a conjunctivitis. Recent statistics show that influenza conjunctivitis does occur. In Rosenhauch's report[1] one finds a number. His six cases consist of an acute conjunctivitis in an infant of 14 days, which resembled clinically gonorrhœal blennorrhœa; a mild case of acute conjunctivitis with muco-purulent discharge in a child of three weeks; a subacute conjunctivitis of both eyes in a child of three months; a subconjunctival abscess; a dendritic keratitis; and, finally, an abscess of the orbital cavity. In all these cases the bacillus influenzæ was isolated, either with the bacillus xerosis or the staphylococcus albus. They show how varied influenzal infections of the eye may be. In the case resembling gonorrhœal ophthalmia, the mother suffered from a leucorrhœa. A bacteriological examination of the mother's discharge would have added interest to the report, and would probably have demonstrated the presence of the influenza bacillus. Gurd[2] described bacilli resembling the influenza bacillus in cases of vaginitis,

and the writer recently obtained from a case of vaginitis a bacillus in pure culture, which was identical with the bacillus influenzæ in morphology, but in culture resembled an organism described in conjunctivitis cases.

The orbital abscess occurred in an adult male of twenty-two years. Twelve days previously he had contracted a "bad cold" with stoppage of the right nostril. For eight days he had a temperature and a profuse nasal discharge. The upper lid of the right eye now began to swell. From the history and examination of the nose, it was seen that the abscess originated secondarily to inflammation in the frontal sinus. In spite of the serious symptoms and the rapid progress of the disease, free incision and good drainage brought about a quick recovery. While conjunctival cases are rarely complicated, cases such as the abscess of the orbital cavity, indicate the necessity for treating influenza infections actively. Serious complications do occur. Eversbusch described a purulent choroiditis in influenza, caused by the staphylococcus citreus and an odd coccus, and Despagnet, a purulent irido-choroiditis through staphylococcus and streptococcus.

Unna[3] discusses the origin of these cases, and while he does not deny the possibility of metastatic infection from the influenza bacillus, he nevertheless believes that we must adhere to the principle that only such metastasis should be recognised as caused by the bacillus influenzæ where the excitor has been proven present in the eye.

Mennier, Jehle, Pacchioni, and others have demonstrated the presence of Pfeiffer's bacillus in the blood, so it is no longer doubtful that it can invade the eye as well as other organs by this route.

Unna[3] reported a case of intra-ocular suppuration from the bacillus influenzæ in an adult of 60 years, who had had a painful and inflamed eye for two days. The lids were swollen, the conjunctiva was chemotic, and the cornea covered with a purulent secretion. Five days later, the globe was evacuated. From the conjunctival discharge, staphylococcus, streptococcus, bacillus xerosis, and bacillus influenzæ were obtained, while from the pus within the eye, the bacillus influenzæ only. Unna emphasizes two points: (1) here was a case of ophthalmitis due to bacillus influenzæ, where a bacteriological and pathological examination was made; and (2) there could be no doubt as to the route of the infection. It was exogenous, as there was no general influenza, as the globe was particularly adaptable to infection from without, and as the presence of the bacillus influenzæ was proven from the beginning.

Fischer,[4] after noting the frequent presence of the bacillus influenzæ in the human conjunctiva as a saprophyte, mentions a positive inoculation by McKee, with an "uncommonly persistent strain of bacillus influenzæ." The organism with which McKee was working, was not, however, bacillus influenzæ, but an organism similar to it only in morphology.

Having met in Axenfeld's clinic with a case of panophthalmitis, from which he obtained the bacillus influenzæ, Fischer experimented with animals to see (1) if he could produce a panophthalmitis with this organism; (2) whether multiplication of the bacilli would take place in the eye; and (3) whether the bacillus was pathogenic for animals. After studying the effect on rabbits, guinea pigs, and white mice, Fischer came to the following conclusions:— (1) The inoculation of bacillus influenzæ into the interior of the eye, especially into the vitreous, can produce a severe inflammation. (2) The inflammation is not due to the death of the organism, and the consequent necrosis of the bacteriological bodies and liberated toxins, but to the multiplication of the bacilli themselves. In other words, a non-pathogenic organism was pathogenic in the vitreous, so that, under these circumstances, we must attribute the ability to produce disastrous inflammation within the globe to

the bacillus influenzæ. Fischer attempted to cultivate the influenza bacillus on serum and peptone-agar, but failed. Rosenhauch, while not denying the growth of bacillus influenzæ on hæmoglobin-free agar, believes that the best medium is blood-agar, and that the presence of the staphylococcus albus expedites the growth. As pigeon's blood is rich in hæmoglobin, it makes the best medium. This seems to be the consensus of opinion on these several points. Some writers report a difficulty in cultivating bacillus influenzæ on hæmoglobin media, after cultivation on hæmoglobin-free media, but I have never experienced this characteristic of the bacillus influenzæ.

Alt has recently reported an epidemic of pneumococcus conjunctivitis, which occurred during the spring and summer.* The infection was always bilateral, and varied greatly in clinical appearance, so that there were few cases which could be called typical. The cases varied a good deal in severity. Some simulated angular conjunctivitis. In the majority, no complications followed, and the duration ranged from five days to several weeks. Alt, during a period of two months, contracted a pneumococcus conjunctivitis twice, showing that there was but a short period of immunity. He advises staining the films with a drop of 1-10000 solution of azure 2 of the Giemsa stain, and says that this gives a beautiful picture, and a much clearer one than any stain he knows of. Nevertheless, it is of the utmost importance to know whether an organism is Gram-positive or negative, and while other stains give clearer pictures, the use of Gram's stain as a routine will be found most satisfactory.

It is now well-understood that Morax-Axenfeld conjunctivitis occurs at times in a very acute form. No form of conjunctivitis varies as much in its clinical picture as the Morax-Axenfeld. Ocampo† recently reported cases of very acute inflammation of the conjunctiva due to this diplobacillus. In certain districts, the diplobacillus is very frequently found as the cause of ulceration of the cornea. Zade[5] described 27 cases where the diplobacillus was found in smear and culture. Curiously enough, in these cases there was an absence of conjunctivitis. McKee[11] reported 28 cases of ulceration of the cornea, due to the diplobacillus. Some of these were undoubtedly secondary infections from the conjunctiva, in cases where foreign bodies had been removed from the cornea.

During zur Nedden's[6] bacteriological work at Bonn, he met with some cases of ulcus serpens, in which no pneumococci could be found. Cultures were made on different media, in order to exclude error as far as possible. In the first case, Gram-negative cocci and the bacillus xerosis were found in the smear, while the culture revealed the bacillus xerosis and streptococcus. In the second and third cases, the bacillus subtilis was found, with colonies of sarcinae and xerosis. The bacillus subtilis was pathogenic for the cornea and vitreous of rabbits.

The reports of Foster[7] and Pusey[8] are of interest. Foster found the typho-bacillus in pus from a case of acute dacryocystitis, in a boy, three weeks after an attack of typhoid fever. Pusey isolated the bacillus pyocyaneus from a case of subacute follicular conjunctivitis, and from a healthy conjunctiva.

Continued examination in ophthalmia neonatorum shows the frequent presence of organisms other than the gonococcus. Harman[9] reports :—

Gonococcus in 80 per cent.
Koch-Weeks, Colon bacillus, Pneumococcus } 20 per cent.

*For an account of epidemics of pneumococcal conjunctivitis, by P. A. Adams and G. Stanculeanu respectively, see THE OPHTHALMOSCOPE, August, 1909, p. 554.—EDITOR.

†For abstract see p. 833 of the present number. EDITOR.

Mayou[10] in forty cases found :—

Gonococcus, 57.5
Staphylococcus, 20.0
Morax-Axenfeld diplo-bacillus, 5.0
Colon bacillus, 5.0
Pneumococcus, 2.5

From the reports of the Montreal General Hospital[11] we find :—

Gonococcus, 52 per cent.
Streptococcus, 12 per cent.
Pneumococcus, 8 per cent.
Micrococcus Catarrhalis, 8 per cent.
Diplo-bacillus Morax-Axenfeld, 4 per cent.

Harman's statement, that film examination is a sufficiently accurate means of detecting the causal micro-organisms, needs to be qualified. Inoculation of suitable media is necessary, at least in all cases where the film examination has been negative.

Rosenhauch[12], after examining the conjunctival sacs of two hundred new-born babies, came to the following conclusions :—

(1) The conjunctival cul-de-sac is absolutely clear immediately after birth.
(2) The first micro-organisms appear twenty-four hours after birth.
(3) After twenty-four hours the bacterial flora is constant.
(4) It is not to be differentiated from the adult.
(5) The staphylococcus pyogenes non-liquefaciens and the bacillus xerosis are constant inhabitants.
(6) Other micro-organisms are only sporadic.
(7) Pathological micro-organisms are seldom found, and then only a few.
(8) Twenty-four hours after birth, the conjunctival sac was never free from micro-organisms.
(9) Gonorrhœal infection is hardly possible during birth, but usually occurs during the first couple of days of life.

In spite of all that has been written about the bacillus xerosis as a benign constant inhabitant of the conjunctival sac, one finds Dernahl[13] describing cases of conjunctivitis as due to this micro-organism.

Grüter[14] last year described a yellow, Gram-negative bacillus, which he isolated from a case of chronic trachoma. In smear he found staphylococci and xerosis-like rods. On serum, large lemon-yellow colonies were found. They did not contain staphylococcus citreus, but a long Gram-negative bacillus. Repeated inoculations of media gave this same bacillus. The micro-organism is a long, xerosis-like rod, with rounded ends. They lie mostly parallel or at right angles. They are easily stained, are Gram-negative, non-capsulated, and non-motile. On serum, the colonies sink into the medium after a few days, and with repeated inoculation, there is some liquefaction along the line of inoculation. Upon agar, there is a good growth of pale-yellowish colour. No pathogenic qualities were found from animal inoculation. Grüter differentiates it from the other conjunctival micro-organisms.

Pascheff[15] has described three examples of a peculiar disease of the edge ot the eyelids. He believes that the malady has not been described, and calls it "Folliculitis ciliaris necrotisans infectiosa." The cause is obscure. In the three cases streptococcus was found in the first, staphylococcus aureus in the second, and a peculiar bacillus in the third. The bacillus in question was isolated from the affected cilia, was found in sections of the diseased parts, and was of an extremely virulent nature. It was a short Gram-negative bacillus, with rounded ends. The micro-organism was examined by Axenfeld,

Morax, and Calmette. Axenfeld thought that it was a bacillus not yet found in the eye, but Calmette regarded it as the pneumobacillus of Friedländer.

Posey[16] recently reported a case of keratitis, probably due to metastatic gonorrhœa. The inflammation occurred in a male of 28 years, and had the characteristics of an unusual form of vesicular keratitis, engrafted upon an old macula. The patient had not suffered from arthritis, but bacteriological examination demonstrated "gonococci" on the cornea, and in the urethral discharge.

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TRANSLATIONS.

CONGENITAL BUPHTHALMUS IN RELATION TO HEMIHYPERTROPHY OF THE FACE.*

BY

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THE co-existence of congenital buphthalmus and hemihypertrophy of the face has never been described. In a study on facial hemihypertrophy which, in collaboration with my chief, Professor Agrégé Sabrazès, I published in the new *Iconographie de la Saltpetrière* in 1897, a study in which we brought

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forward an interesting observation on this congenital form of the disease, I only discovered one case, that of Ziehl, in which the author reported convergent strabismus with fairly high unilateral myopia on the side corresponding to the congenital hemihypertrophy of the face.

My present observation concerns a little girl of six years, who, ever since birth, has shown an enormous increase in size of the right side of the face, especially of the upper part; the eyeball, and upper temporal and zygomatic regions. This hemihypertrophy affects also the corresponding ear, the right alveolar borders of the superior and inferior maxillæ, and the right side of the tongue. A very large deep subcutaneous angioma formed by a plexus of apparently obliterated vessels (which remind one of a bunch of tangled twine, are not reducible, do not present any pulsation or expansion, and yield no *souffle* on stethoscopic auscultation) occupies the right temporal region. This region is three times its normal size, and its limits are the frontal above, the external orbital apophysis in front, the prominence of the temporal behind, and the malar apophysis below. All the adjoining bones, infero-external part of the frontal, malar apophysis of the superior maxilla and malar bone, and zygomatic apophysis, are so much increased in volume as to appear almost thrice the size of the bones of the opposite side. The bones are irregular on their surfaces and as if worm-eaten (*vermoulues*).

The considerably enlarged right orbital cavity presents no inequalities on its borders. It is, as it were, the centre of the bony hypertrophy, which is localised more especially on the upper half of the bony mass of the face and side of the skull.

The right eyeball, which is at least twice the size of the left, is constantly quite covered by the hypertrophied and drooping upper lid. The globular cornea has a diameter of two centimetres, while that of the left is eleven millimetres. It presents indistinct opacities, its epithelium is dull, especially towards the periphery and in its external portion. To the inner side there is a slight pannus. The anterior chamber is very deep; the iris, light-brown in colour, has a central pupil, dilated and immobile. The lens is completely cataractous, vision is *nil*, the eye is not tense. The appearance is, in fact, that of an ordinary buphthalmic eye.

The left eye is healthy, but on account of the timidity of the child, it is impossible to ascertain the visual acuity.

The eye was enucleated and found to have a length of 38mm. and a breadth of 30mm. Its size was increased in a regular manner. There were no staphylomata, and the cornea appeared to be continuous with the sclerotic without any very sharp line of demarkation; the normal well-marked transition between the curvatures of these two membranes was hardly appreciable. The disc presented an excavation which might be considered physiological. On section, the anterior chamber was deep, the lens thinned and atrophic and reduced to cataractous *débris*; total retinal detachment. One point was most striking on simple macroscopic examination, namely, the great distance between the insertion of the base of the iris and that of the ciliary body, an anomaly which was more clearly shown on microscopic examination. Such examination revealed a little œdema and inflammatory infiltration between Bowman's membrane and the superficial layers of the corneal tissue.

The filtration angle was of normal dimensions. There was no Knies adhesion (*soudure de Knies*). Schlemm's canal was plainly seen; it was normal, oval in form, not flattened. The trabecular spaces were clear. The iris, ciliary body, choroid, and retina showed signs of atrophy, without any traces of inflammation. The deep angioma of the temporal fossa, the vessels of which are now obliterated, has certainly been at the root of the hyperplastic and

hypertrophic processes of all the neighbouring regions—skin, bony surfaces, and eye. The mechanism of these hypertrophies of tissues and organs in the neighbourhood of angiomata is well-known. There are several publications on the subject. I will merely refer to the thesis of Duzéa which treats of "Some developmental defects of the skeleton due to superficial angiomata" (Lyon, 1885-1886). Among other cases to be found therein is one of a superficial nævus of the right leg which caused a hypertrophic lengthening of 4 centimetres in the corresponding bones. Another case is that of a congenital angioma of the posterior part of the right leg and thigh, with recent varices, which caused a hypertrophic lengthening of the right femur and tibia. And so on. The author also cites two observations of superficial extensive angiomata of the face with increase in size of the superior and inferior maxillæ without involvement of the eye. In the neighbourhood of angiomata, especially deep angiomata, there is an almost hypertrophic venous circulation, and a superactivity of the dilated lymphatics, which may explain why, in our present case, in the near neighbourhood of the temporal angioma, the bone, the soft tissues, and the eye were all increased in volume. * * * *

Up to the present time there have been two pathogenic theories of the genesis of congenital hydrophthalmus.

The first and most largely supported theory is that which considers hydrophthalmus to be an infantile glaucoma, in fact an affection by retention, by congenital or (intra-uterine) inflammatory obstruction of the filtration angle, and of the canal of Schlemm and the trabecular spaces. The shell of the eye, which is stretchable in the new-born and in the child, becomes distended, and hydrophthalmus is brought about with its triad of symptoms, namely, ocular distension and megalocornea, hypertension, and glaucomatous excavation of the disc. This is the theory which has been upheld with more or less eloquence by the partisans of the theory of obstruction, Horner, Mauthner, Haab, Durr, Muralt, Pflüger, Dufour, etc.

As in the case of adult glaucoma, the theory of hypersecretion has had its supporters; the origin of hydrophthalmus is nervous, remote from the eye itself. Thus thought Demours, Gallenga, and, more recently, Angelucci.

To these two theories of the genesis of hydrophthalmus, the theory of obstruction and the nervous theory, I may be allowed to add here a third, which may be called the theory of congenital hypertrophic malformation of the eye, or of anomaly from excess in development of the eye. This congenital hypertrophy is analogous to certain hypertrophies of the limbs, of the fingers, and so on. Why should not the eye be born larger, in the same way as one side of the face, one leg or one thumb, without having to invoke the retention theory or the hypersecretion theory to explain its increased volume?

Here are arguments in support of my opinion:—

(1) Congenital defects have been found to co-exist with hydrophthalmus: defective formation of the skull, simple displacement of the pupil (Kessler, Mayerhausen, Warlomont), epicanthus (Panas, Gros), irideremia, sometimes with absence of the ciliary body (Pflüger, Brunhuber), partial coloboma of the iris (Gallenga), the co-existence of six fingers and six toes (Himly, cited by Mackenzie), multiple pigment blemishes (my own observation).

(2) The anatomical study of our buphthalmic eye, in which there is no trace of uveal inflammation, no Knies adhesion; in which the canal of Schlemm and the spaces of Fontana are absolutely permeable; in which neither increase of tension nor excavation of the disc is found; such anatomical study well indicates that it is possible to imagine, in explanation of the increased volume, a different and more general pathogenesis than that which has been invoked hitherto. Besides, there is no doubt in our particular case that the facial

hemihypertrophy and the corresponding buphthalmus are dependent upon the large deep-seated angioma of the temporal region. The ocular anomaly by excess, like that of the face, has been due to hypernutrition of the neighbouring regions. ERNEST THOMSON.

SOME NEW VIEWS AS TO THE PATHOGENESIS OF PRIMARY CATARACT.*

BY

NOÉ SCALINCI,

NAPLES, ITALY.

IT is no exaggeration to say that we are ignorant of the exact pathology of a single one of the clinical forms of cataract. Our ignorance upon the point depends largely upon the fact that the crystalline lens, although understood in its development and in its anatomical structure, has up to now been ignored in all that is concerned with its chemico-physical construction and the properties of its proteids, taken in connection with recent advances in the chemistry of the colloids.

Nevertheless, the researches of Bottazzi and of Scalinci, who have occupied themselves with this subject, have thrown some light upon the pathogeny of cataract.

The crystalline lens may be looked upon as a mass of organic hydrogel, of characteristic form, and possessed of a certain degree of imbibition. The hydrogel is formed of two substances—namely, soluble phacoprotein, which swells indefinitely, and insoluble phacoprotein, which swells up to a certain point. Without going deeply into the characters of these substances, a couple of facts must not be allowed to escape us, since they help us to understand some of the causes of lental opacity. First, that in normal conditions lental phacoprotein occurs in the state of alkali albumin (the sodium chloride of the ocular liquids would precipitate it if, on the contrary, it occurred as acid albumin); secondly, that although the two colloids are distributed equally in the cortical layers and the nucleus, yet they form, together with the fluid with which the lens is imbibed, a homogeneous system.

The crystalline transparence of the lens is consequently due to the fact that the constituent colloids find themselves in the state of hydrogel, which is not the case if they occur in the state of hydrosol, or, worse, of a granular mass, as the cytoplasm of the other elements. The fundamental reason for the perfect transparency of the lens lies in a physical and chemico-physical differentiation of the original elements of the crystalline.

This granted, let us see what are the factors which alter the transparence of the lens, indispensable for the optical functions of the eye.

For clinical observers, an opacity until recently represented a disturbance of nutrition, and was consequently the result of an alteration in the nutrition of the lens. But later researches upon the opacity produced by salt, and especially the study of osmotic phenomena, have led to the suspicion that cataract may be caused by a dehydrant action upon the crystalline. Moreover, researches upon osmotic phenomena showed that the lens was hypertonic in respect of the liquids in which it is plunged, a solution which does not affect its transparence being considered as isotonic for the lens. There lay the con-

* XI Congresso Internazionale di Oftalmologia, Naples, 27 April, 1909, and *Archives d'Ophtalmologie*, septembre, 1909.

firmation of the hypothesis that the opacity would depend on a disturbance in the osmotic conditions. Although the lack of osmotic equilibrium between the lens and the endo-ocular fluid represents a physiological absurdity, yet Leber, desiring to explain why the lens, despite that, did not become opaque, supposed that the capsular epithelium had the property of regulating the hydric needs of the lens, and that its *rôle* was to safeguard the integrity of the lental mass by preserving it from the loss of proteid constituents.

From these inexact ideas, a still more erroneous physiological and physico-pathological notion has been drawn, *viz.*, that the epithelium stands as guardian of the lental transparency, since should it undergo alteration, the lens fibres become opaque. It is, indeed, from this conception that the most recent theories as to the pathogeny of cataract have arisen.

These physiological and pathogenic conceptions, however, must be abandoned, for the following reasons:—

Up to the present when studying the relationships between the lens and the surrounding fluids, we have taken account only of the factor dependent upon the osmotic process, and have entirely neglected the phenomena of imbibition. The osmotic force acts from outside, and tends to subtract water, while the force of imbibition, on the contrary, acts from inside and tends to attract liquid to the lens. Therefore, we should not speak of osmotic equilibrium between the lens and the endo-ocular fluid, but, better, of imbibition equilibrium. In other words, we can affirm that under normal conditions there exists a perfect equilibrium between the imbibition pressure of the lens, on the one hand, and the osmotic pressure of the ocular fluids, on the other. The pressure of the mass of hydrogel impressed (*la masse d'hydrogel imbu*) is represented, on one side, by the elastic tension of the capsule, and, on the other, by the power of imbibition possessed by the ocular fluids, which, in its turn, depends not only upon the total osmotic concentration, but also upon the nature of the electrolytes and non-electrolytes dissolved in it.

Inasmuch as each lenticular fibre is limited by an imperfectly or partially permeable membrane (in the sense in which we admit that erythrocytes and the cells of living tissue are so), and the stratification of the fibres being granted, the most external layers of the latter take the place of a membrane in respect of all the inner crystalline mass. From the standpoint of chemico-physics, it should be, moreover, indifferent that between the mass of the lens and the elastic capsule there lies a semi-permeable membrane, or that the most external layer of the lental fibres acts as a semi-permeable membrane. It is the capsule that limits the degree of swelling of the lens, which under physiological conditions is not at a maximum of imbibition, because it is prevented from becoming so by the elasticity of the capsule.

In general, the lens, when immersed in solutions of different concentration, is more disposed to absorb water, to increase its weight, and to swell, than to lose water, to diminish in weight, and to contract, not differing in that particular from the other tissues of the organism. From the researches mentioned it follows that sodium chloride, so far from facilitating the process, prevents and slackens the process of imbibition.

We may now ask ourselves what are the causes capable of producing opacity of the lens. Assuredly, it is not provoked by the absorption or subtraction of water, since the aqueous contents of the lens may vary within certain limits compatible with the most perfect transparency. In fact, during the course of the researches mentioned above, we saw that the lens could absorb water, increase in weight, and still retain perfect transparency. In the same sort of way it could lose water and diminish in weight, as when it

was suspended above water or on saline solutions of a different concentration, and yet retain its transparency. Thus, the lens suspended in dry air, over calcium chloride, retains perfect transparency, although it may have lost one-half its weight in the process—that is to say, an enormous quantity of water, such as it never loses in hypertonic solutions.

The causes which lead to opacity of the crystalline may be summed up in the following statement: "Every cause capable of transforming the homogeneous system, constituted by the lental colloids with the fluid that bathes the lens, into a heterogeneous system may determine opacity of the crystalline." As a cause of opacity we may, before all, cite diffusion of the colloid without limit of swelling anew, such as comes about when the lens remains for a long enough time in water or in neutral alkaline solutions, which necessarily set up disaggregation of the fibres of the crystalline and of the colloid with limit of swelling anew, whence comes the opacity. The hydrogel may become heterogeneous by a simple fault in the mechanical connection of the fibres of each superficial layer and of the different layers in connection one with another, a default that may also occur by dissolution of the material that binds the fibres and unites the different layers together, and, again, by the diffusion of this material to the outside.

Another cause of opacity is to be sought in the nature of the lental colloids. Since the last-named, as has been said, have the character of alkali albumins, it becomes easy to understand that if acids act upon the lens, a precipitate of neutral phacoproteid will be formed in a quantity that will correspond with the amount of phacoprotein neutralized. Homogenous hydrogel will thus become heterogenous, and an opacity will result.

My investigations prove that this is exactly what happens, and that feeble acids, such as acetic, formic, oxybutyric, etc., in much diluted solutions dull the lens in a marked way, much more so, indeed, than do strong acids, such as hydrochloric and sulphuric.

In addition to acid, even salts are capable of producing dulness of the lens, and that independently of the concentration of their solutions. The alkali albumin character of the lental colloids being granted, it seems that the cathions have the power of precipitating the bivalents and the trivalents especially, to judge from the results of my systematic researches carried out with salts, not yet completed.

The information given above about the chemico-physical nature of the lens, its properties and its proteids, should not only dissipate many errors, but should also open the way to more exact knowledge concerning the pathogeny of primary cataract. By reason of the nature of phacoprotein, which is in the state of alkali albumin, it becomes probable that in all conditions of organic acidification capable of modifying the reaction of the liquid in which the lens is immersed, the latter is subject to precipitation of the proteid, and consequently to opacity. This throws a strong light upon the pathogeny of the cataract found amongst individuals affected with uricæmia, oxaluria, and especially with diabetes, which represents precisely the highest expression of organic acidification.

But beyond these categories of primary cataract, which are the most frequent, there remain others which can be explained, better than they are today, by the action of the endo-ocular fluids upon the lental proteids. For example, cataract which follows convulsions (epilepsy, hysteria), and particularly tetanic cataract, may be with justice classed amongst the opacities caused by precipitation. It is known that in these conditions the reaction of the blood may be modified by the great production of lactic acid. By experimental tetanisation, in fact, it has been found that the lactates in the

OPHTHALMOLOGICAL INSTRUMENTS

MADE BY

E. B. MEYROWITZ,

LONDON, PARIS AND NEW YORK.

(1) By Rayner D. Batten, M.D. The Hydrophthalmoscope
(2) A New Rheostat.
(3) An Instrument for Measuring, Objectively, the Interpupillary Distance and the Tangent of the Angle "Gamma."
(4) A Luminous Retinoscope.
(5) A New Projection Lamp.
(6) By Percy Bardsley, M.A., M.B., B.C. The Scotometer.
(7) By J. H. Tomlinson, M.R.C.S., L.R.C.P. The Scotomagraph.

The above instruments are briefly described below—further information will be gladly given upon application, or, by arrangement, they can be obtained upon trial.

(1) **The Hydrophthalmoscope.** The instrument consists of a metal eye-cup, of a somewhat similar shape to the ordinary eye-bath, with smooth rounded edges. A short metal tube is soldered into its upper and lower surfaces, to which india-rubber tubing can be affixed. The upper india-rubber tube is short—about 2 in. long—and can be closed by a clip. The lower india-rubber tube is about 1 yard in length, and connected with a reservoir. The anterior surface is a plane glass.

For examination purposes, the upper margin should be applied to the upper lid first, so as to raise it. The patient is then directed to raise the reservoir to above the level of the cup, and the clip is held open until the fluid rises to the upper opening, when the clip is closed, and the patient is directed to lower the reservoir about 9 inches to a foot. When successfully applied, the cup will then remain in position.

The corneal refraction practically disappears The iris appears flat, and its margins are sharply defined against the sclerotic, so that the extreme angle of the anterior chamber is clearly defined, which should render nodules or growths in the angle easier of examination.

Owing to the abolition of the refraction from the anterior corneal surface, the total refraction of the eye is lessened some 30 Diopters, a normal eye requires a lens of about + 25 D. at a short distance from the eye to restore vision of ^{6}.

On examination with the ophthalmoscope, the fundus can be seen at a distance of about a foot ; the image is erect and very small. This image can be enlarged by using a lens, as in the ordinary indirect examination. The fundus can also be well seen by direct examination.

For the application of the Instrument as a continuous eye bath, the upper tube is replaced by a long tube and both tubes supplied with a regulating clip or stop cock.

(2) **A new Rheostat.** This is a new model of the American instrument introduced last year. It is London made and has several improvements upon the older pattern. It is less likely to burn out and the adjustment being by a rack and pinion a much finer degree of variation is obtainable.

It will fit any lamp holder on any voltage—the voltage being determined by the compensating lamp supplied and can be used for galvanisation, electrolysis, or cataphoresis. It will light any surgical lamp from 1 to 15 volts.

(3) **An Instrument for measuring objectively, the enterpupillary distance and the tangent of the Angle "Gamma."** This consists, practically, of a reversal of the Ophthalmometer—a head rest—two objectives to pick up the visual axes and a collecting eyepiece. The patient fixes a point upon the head rest per a strip mirror placed over the objectives. The observer upon looking through the eyepieces obtains an image of each pupil, and by an adjustment of the two objectives the images are brought together so that the enterpupillary distance can be read in millimeters on a scale. The point of fixation being at a distance of 18 inches, the difference for the convergence in relation to parallelism is given on a chart provided. For the measurements of the corneal tangent of the Angle "Gamma" two lamps are fitted to the instrument and the reflexes are measured with regard to the above measurements.

(4) **A Luminous Retinoscope.** This has been constructed on the principle of the optical lantern—the light from a 2-volt lamp being collected by a short focus condenser, and the emergent rays being projected by an achromatic objective. The result is that a metre distance a clear disc of light of $1\frac{1}{2}$ inches diameter, equally illuminated from centre to periphery, and without any trace of filament, is projected on the eye. It can be worked from a tiny battery fitting the waistcoat pocket. The light being a very narrow divergent beam, it should operate as a plane mirror.

(5) **A new Projection Lamp.** This is on the same principle as the luminous retinoscope, but of a larger diameter, and without the mirror for turning the vertical beam to the horizontal. The projected disc is about 3 inches diameter at $1\frac{1}{2}$ meters. It is made to fit the Moorfield's pattern bracket.

(6) **The Scotometer.** This instrument has been well received by ophthalmic surgeons, and fulfils its purpose remarkably well. It is strongly urged that a trial be given to test its value.

(7) **The Scotomagraph.** This instrument will be ready for delivery during the present week. It has been much improved since being shown at Oxford and Belfast, and an addition has been made so as to provide spectral colours for testing the sensibility of the retina.

The whole of the instruments above described are of London manufacture.

The "Meyrowitz Bulletin" can be obtained upon application to E. B. Meyrowitz, 1a, Old Bond Street, London.

blood, as well as those eliminated by the kidneys, are augmented, and consequently, according to all likelihood, this condition should have an unfavourable influence upon the transparency of the crystalline lens.

As to the pathogeny of total congenital or infantile cataract, we know nothing precise. It appears to me, however, that even these forms may be connected with a precipitant action of the endo-ocular fluid upon the lens. If the anatomical researches of Hess lead us to believe that fusiform cataract and central cataract are the result of a developmental fault, I do not think that this explanation can be stretched so to cover stratified cataract and, still less, total congenital cataract. As to these last forms, bearing in mind their almost constant bilaterality, I venture to affirm that my views are capable of removing their pathogeny from the morphological hypothesis brought into prominence by Hess.

Lastly, even the only form of professional cataract known to us, namely, that which affects glass-blowers, may be plausibly explained on the views brought forward in the course of the present communication. In these workmen, it may be assumed that by reason of a circulatory stasis, there is an accumulation in the blood of carbonic acid, and, consequently, a possibility of its deleterious action upon the lens.

Besides this opacifying action of the endo-ocular fluid, we must take into account the structural integrity of the walls of the vessels and of the secretory epithelium of the ciliary processes. Otherwise, it would be impossible to understand why individuals who, according to all appearances, should be influenced by the conditions of organic acidosis do not always present the same alteration in the transparency of the crystalline lens.

SYDNEY STEPHENSON.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—ANATOMY AND PHYSIOLOGY.

(1) **Raehlmann, E.—On the anatomy and physiology of the pigment epithelium of the retina.** (Zur Anatomie und Physiologie des Pigment Epithels der Netzhaut.) *Zeitschrift f. Augenh.*, Jan, 1907.

(2) **Carlini, V.—Elastic tissue in relation to the glands of Moll.** *Annali di Ottalmologie*, Vol. XXXVI (1907), Fasc. 3-4, pp. 231 and 234, with one plate.

(3) **Caillaud.—Physiology of the iris. The present state of our knowledge on this question.** (Physiologie de l'iris. (Etat actuel de nos connaissances sur cette question.) *Gazette des Hôpitaux*, 21 décembre, 1907.

(4) **Bartels, M.—On primitive fibrils in the axis cylinders of the optic nerve, and on the significance of varicose axis-cylinders.** (Ueber Primitivfibrillen in den Achsencylindern des Nervus opticus und über die Werthung varicöser Achsencylinder.) *Arch. f. Augenheilk.*, Bd. LIX, Heft 2, Februar, 1908, p. 168-177. Illust.

(5) **Fortin.—Physiological muscæ volitantes.** (Mouches volantes physiologiques.) *Recueil d'Ophtalmologie*, février, 1909.

(6) **Hess, C.—Investigations concerning the extent of the active pupillomotor area of the retina and concerning the pupillo-motor receiving organs.** *Archives of Ophthalmology*, March, 1909.

(7) Magitot.—On the premature appearance of the photo-motor reflex during fœtal development. (L'apparition précoce du réflexe photo-moteur au cours du développement fœtal.) *Ann. d'Oculistique*, T. CXLI, p 161, mars, 1909.

8 Mizno, G.—A peculiar entoptic phenomenom. (Ueber eine eigenartige entoptische Erscheinung.) *Arch. f. Augenheilkunde*, Bd. 63, April, 1909, 109-119.

9 Wolfrum.—A research upon the macula lutea of the higher mammals. (Untersuchungen über die Macula lutea der höheren Säugethiere.) *Bericht der Ophth. Gesellschaft*, 1908, S. 206 (Volume published in 1909).

10 Levinsohn, G.—On the cortical centres for movements of the eyes, determined by experiments on monkeys. (Ueber die Korticalen Centren der Augenbewegung nach Experimenten an Affen.) *Bericht der Ophthalmologischen Gesellschaft, Heidelberg*, 1908.

(11) Polliot.—Contribution to the study of visual projection. (Contribution à l'étude de la projection visuelle.) *Recueil d'Ophtalmologie*, septembre, 1909.

(1) This is an elaborate embryological study of the development of the pigment epithelium and the rods and cones of the retina, and is unsuited for abstraction. A. Levy.

(2) **Carlini** has found that the connective tissue around the modified sudoriparous glands of the palpebral margin, or glands of Moll, is very rich in elastic elements, which form a thick layer below the *membrana propria* of the sacs. It is not possible to state that this elastic tissue has any thing to do with the origin and position of the dilatures of the secreting tube of the glands in question. A. Antonelli.

(3) This account of present-day knowledge of iris function is so full of detail that justice could not be done to it in an abstract.

(4) According to **Bartels,** the axis cylinders of the optic nerve are made up of minute fibrils just visible with a $\frac{1}{12}$ oil immersion lens. On cross section, they apppear as fine dots surrounded by the myelin sheath, and on longitudinal section, as delicate fibres of uniform thickness, and lying equidistant from each other. They are embedded in a homogeneous mass which the author terms "axoplasm." Both the fibrils and the axoplasm are very difficult to stain. For this purpose the tissues must be fixed as soon as removed. The number of fibrils varies from 2 to 20 in each axis cylinder. Their disposition in the nerve is rather curious, for it appears that for every cone of the macular region there are several fibrils, while several rods and cones at the periphery of the fundus possess only one fibril in common. With reference to varicosities of axis cylinders, Bartels' researches seem to indicate that they can only be regarded as certainly pathological when they exceed the nerve fibre in thickness; otherwise they are not necessarily pathological. They may represent the real thickness of the axis cylinder, the remainder of which has undergone shrinkage. This view derives support from the fact that when the tissues are properly fixed, there is no space between the axis cylinder and its myelin sheath. When, therefore, a space is visible, it is due to shrinking of the axis cylinder. Percival J. Hay.

(5) **Fortin** does not agree with the view, recently advanced by certain authors, that muscæ volitantes are indicative of pathological changes in the structures concerned in accommodation.

By entoptic observations (looking at a brightly and uniformly illuminated surface through small holes in an opaque disc) he has been able to classify the free elements in the normal vitreous as follows:—

1. Long filaments of uniform calibre with bright clear centres bounded by two dark distinct lines. These filaments are several times longer than broad they are sometimes rectilinear, sometimes sinuous, and undulate slightly during movements of the globe.

2. Filaments showing regular constrictions, like streptococcal chains or a string of pearls.

3. Fine semolina-like grains. These can only be seen when a very brightly illuminated surface is observed, *e.g.*, when viewing the sun through several layers of blue glass.

4. Long entangled filaments in conglomerate masses. These can be made visible to every one, and are regarded by Fortin as the truly physiological muscæ volitantes. J. JAMESON EVANS.

(6) By means of an apparatus, something like a perimeter, in which the disc on the arm is replaced by an electric lamp, **Hess** has made careful and elaborate investigations as to the extent of the retina which is pupillo-motor active. He finds that the area thus active is very small, not more than 4 mm. in diameter, while the rest of the retina is inactive. Starting with the lamp in the position of the blind spot, no change in the pupil is caused by moving the light upwards, downwards, or outwards. This is because the amount of diffused light falling in the fovea is not appreciably altered. By means of observations on the eyes of birds, Hess has convinced himself that the pupillo-motor receiving apparatus is situated in the outer portions of the cones.

ROSA FORD.

(7) **Magitot** has examined the eyes of fifty prematurely born infants, with a view to ascertaining the age at which the light-reflex is established. The phenomenon first became apparent at the end of the fifth month of gestation as a very slight movement, was more marked during the sixth month, and by the middle of the eighth month, had become as active as at full term. The author considers that the appearance of the light-reflex at the end of the fifth month of pregnancy is in agreement with the known development of the visual cells, origin of the nuclei of the third nerves, and partial maturity of the sphincter pupillæ at that period; but at variance with certain other points, such as the *rôles* attributed to the Edinger-Westphal, Darkschewitsch, and Bechterew nuclei, and the condition of the dilator pupillæ.

A most interesting point is that the optic nerves appear to be able to convey impressions of light at a period when their myelin sheaths are certainly not developed. R. J. COULTER.

(8) **Mizno** describes an entoptic phenomenon, which is similar in some respects to one described by Purkinje. It may be elicited as follows.—Accustom the eyes to darkness for half an hour, and then look at the moon for two or three minutes. Cover one eye without touching it, when glistening strands will appear in the luminous area round the moon. They will be seen to represent the inverted image of the retinal vessels. Mizno found, that the lines in the figure corresponded in every detail with those seen in Purkinje's shadow phenomenon, with this difference, that they appear bright upon a dark background and not *vice versâ*, and that they are only seen when the light is shut off from the eye, and not when it is re-admitted. He gives two explanations for the phenomenon, one based upon Helmholtz's theory of the after-images, and the other founded upon Hering's theory of the complementary functions of visual areas. PERCIVAL J. HAY.

(9) **Wolfrum** (Leipzig) has examined the maculæ of a large number of apes, of man, and of the human embryo. The tissue was fixed in Zenker and then treated with osmic acid. The hardened objects were imbedded in celloidin. The paper contains nothing very new, and should be read in the original by those interested in the comparative anatomy and development of the macula. T. HARRISON BUTLER.

(10) **Levinsohn** (Berlin).—This article was one of the most interesting of those presented to the Congress, and those who read the short abstract in the *Bericht* will await with impatience the publication of the full details of the research.

The cortex has generally been explored, with a view to mapping out the areas associated with groups of muscles all over the body, the movements of the eyes have been noted in the same way as have movements of the other parts, but little research has been devoted exclusively to this subject. Three parts of the cortex have been held to be intimately connected with the ocular musculature—the posterior part of the frontal lobes, the angular gyrus, and the occipital lobe. English physiologists, including Ferrier, Beevor, Horsley, Schaefer, Mott, Risien Russell, Sherrington, and Parsons, have always favoured the claims of the frontal lobes, whereas in Germany the angular gyrus and the occipital cortex have been regarded as primarily responsible.

The author has utilised 15 apes, and has operated upon many of them two or three times. The experiments proved that by far the most sensitive part of the cortex with reference to ocular movements was the posterior half of the frontal lobe. Movements were always promptly elicited by currents which failed to stimulate the angular gyrus or the occipital lobe. The two latter situations seemed to possess about equal importance, but the angular gyrus generally required a stronger current than the occipital lobe. The eye movements were almost always associated and concomitant. Sometimes a weak current caused greater vergence of the eye on the side stimulated, and occasionally the opposite eye failed to move. The movement is either a pure lateral movement or a lateral combined with an up or down movement. It is possible to separate distinct areas for these various movements. The most excitable cortex is just in front of the vertical rising branch of the sulcus frontalis. Stimulation of the region round the prolongation of this sulcus causes pure lateral vergence. Directly under this area we get a combination of lateral vergence to the opposite side with raising of the globes. Stimulation just over this area caused a vergence away from the side stimulated and downwards. The region for the latter combined vergence stretches along the sulcus precentralis. The further we leave the end of the sulcus frontalis, the stronger the current necessary to produce the reaction. Stimulation of the cortex stretching dorsalwards from the horizontal branch of the sulcus precentralis gives rise, in addition to eye movements, to movements of the head and neck. Although the up and down vergence of the eyes are associated with definite areas of cortex, yet a strong current applied to the areas for pure lateral vergence causes up and down vergence to be added to the lateral. Generally, the gyrus angularis is sensitive for eye movements only behind the Sylvian fossa. The most excitable area is the middle of the posterior convolution. In the anterior convolution behind the intra-parietal sulcus is a narrow area whose stimulation sometimes results in a pure vergence to the opposite side or upwards. Stimulation of the central portion of the occipital lobe causes a pure lateral vergence. Stimulation of the anterior part is followed by vergence to the opposite side and downwards; whereas an excitation applied to the posterior part results in a movement towards the side stimulated and upwards.

If one eye muscle be tenotomised movement in the direction of the injured muscle is very slight, thus proving that the movement is due to a direct stimulation of the agonist, and not an inhibition of the tonus of the antagonist.

If the two lateral muscles be exercised the movements not only of convergence and divergence, but also the up and down movements are very small. This contradicts the suggestion of Hughlings Jackson that the eyes move little up and down because the stronger ennervation of the lateral muscles masks that of the superior and inferior.

When the cortex was extirpated, there was no permanent alteration in the position of the eyes.

When the angular gyrus was removed, the sensitiveness of the opposite eye was diminished ; for example, the corneal lid reflex was not so prompt.

These are some of the results obtained by this interesting research, results which confirm those obtained by our own physiologists. The research is a most important one, and the full details will be awaited with interest.

T. HARRISON BUTLER.

(11) **Polliot** states that the apparent size of objects looked at depends on their relation to the point of convergence of the visual axes. Objects which are nearer the observer than this point of meeting of the visual axes are in a position of relative divergence, and are doubled (crossed) enlarged and give parallactic movements "against" the movements of the eyes. Objects beyond the point of convergence are also doubled, but homonymously so, apparently diminished in size and give parallactic movements "with" the eyes.

Objects situated at the point of convergence are single, of true size, and give no parallactic movements.

The effect of placing objects in positions of relative convergence and divergence can be shown experimentally by placing prisms, say, of 10°, base out and base in before the eyes. Stereoscopic exercises without a stereoscope also place objects looked at in a position of relative divergence, while in pseudoscopy they are in a position of relative convergence.

He brings forward experimental proofs that the change in the apparent size of the objects is not due to accommodation. By considerable practice accommodation and convergence can be dissociated, and the change in size is then found to be due to the latter.

The surface of projection, according to Polliot, approaches a sphere passing through the point of fixation and having for its centre the middle of the line between the centres of rotation of the two eyes (the cyclopic eye). The form of this surface is very indefinite at the periphery, and in the useful region of the visual field (*disque explorateur*) it is coincident with the horopter. Beyond a zone of small extent (20° at most) around the macula, projection is very indefinite.

In examining objects at a distance, this part of the retina has to be moved about—and concurrently the *disque explorateur*—to give a clear picture of the peripheral part of the field ; and the whole picture is formed by the retention of these varied and fleeting, but not simultaneous, impressions, by the memory. When objects at a finite distance are examined, the *disque explorateur* fixed at the point of convergence is displaced along with the latter, not only in height and width, but also in depth. There is then not a complete picture on a single surface, but a series of pictures, each with its own surface of projection. When the convergence is modified each picture differs from the preceding by the dimension and disposition of the diplopic images which enlarge, diminish, approach each other, fuse or get farther apart, as the case may be. The observer experiences also a sensation of muscular contraction, a definite effort

of convergence. These are the essentials of binocular localisation, but convergence plays the most important part. In fact, it is convergence which constantly furnishes us, by the sensations of equilibrium or the associated muscular contraction, with the exact estimate of the distance of the point fixed and the surface of projection. It is a further proof of the importance of muscular sensation in all estimations of space.

It has not yet been shown why a movement of convergence should increase or reduce the size of an image. J. JAMESON EVANS.

II.—MECHANICAL NYSTAGMUS.

Sébileau (Pierre) and Lemaitre (Fernand).—A mechanical nystagmic reflex and a plug of cerumen. (Réflexe nystagmique mécanique et bouchon de cérumen.) *Ann. d'Oculistique*, T. CXL, p. 181, mars, 1909.

Sébileau and **Lemaitre** give a detailed description of a case of nystagmus due to the presence of cerumen in the external auditory meatus. The patient, a man aged 41, had a plug of wax in his left ear and a normal right ear. On pressing on his left external auditory meatus, and in a less degree on chewing, laughing, yawning, or hiccoughing, he complained that he got giddy and objects appeared to move in front of his eyes. These symptoms were accompanied by short rapid horizontal nystagmic jerks on the left side and a tendency to fall backwards. If the pressure was diminished, the nystagmic movements became smaller and slower. Rotation of the patient to the right ten times in fifteen seconds produced horizontal nystagmus towards the right in the right eye, lasting twenty-two seconds, while similar rotation to the left produced very evident horizontal nystagmus towards the left, lasting two minutes, accompanied by tendency to fall towards the left and vertigo lasting fifteen seconds. The following galvanic reactions were found: A. With the positive pole on the right and the negative on the left, (1) nystagmus in the left eye with diplopia on looking to the left in one minute with a current of two milliampères. (2) A. With the patient sitting no vertigo on opening or closing the current; but with the patient standing slight sensation of falling to the right and a little lateropulsion towards the right on closing the current. B. With the negative pole on the right and the positive pole on the left (1) very slight nystagmus in the right eye in three minutes with a current of five milliampères. (2) With the patient sitting no vertigo; slight movement of the head; with the patient standing, vertigo and sensation of falling and retropulsion very definite on the left side on closing the current.

The eyes were examined by Morax, who found the following conditions.—The pupils, media, fundus, and vision were normal. The refraction was emmetropic. Under ordinary conditions of fixation, there was no nystagmus, no diplopia with a coloured glass, and no limitation of the field of vision. If a coloured glass was placed in front of either eye and nystagmus was produced by pressing on the wax, the patient being in a vertical position, homonymous diplopia was produced, the images being 10 to 15 c.m. apart in the median plane at a distance of 4 m. A peculiar feature of this diplopia was that the image seen by the left eye was steady while that seen by the right was in a state of continuous lateral oscillation. This phenomenon persisted no matter which eye had the coloured glass in front of it, although the nystagmus was of equal intensity in both eyes. A similar experiment was tried with the patient lying

in a horizontal position, when vertical diplopia was produced, and once more the image of the right eye alone appeared to move, the oscillation being vertical. At the moment that the nystagmic reaction was produced, the patient being in a dull light, the pupils dilated a little "as when the tonic contraction of convergence relaxes." Analysis of the ocular symptoms observed at the moment of the production of the nystagmus shews that they would be explained by a paresis of the right external rectus, but Morax does not admit the existence of such a lesion. The vertigo and tendency to fall were produced by pressure on the wax while the patient kept his eyes closed, so that there was connection between them and the ocular symptoms (nystagmus and diplopia).

The authors give the following explanation of the connection between the aural and ocular conditions.

The Viennese Otological School has recently shewn that there is a definite reflex starting from the ampullæ of the semicircular canals and passing by the labyrinths, vestibular nerve, ganglion of Scarpa, eighth pair, and nucleus of Deiters to the oculo-motor nuclei. According to the stimulus by which it is provoked, this nystagmic reflex can be mechanical, rotating, thermal, or galvanic. Omitting the galvanic form, which seems to be produced by nervous stimulation of the whole of the labyrinth or perhaps of the entire brain, the other reflexes are caused by endolymphatic movements in accordance with the rule established by Ewald's experiments, viz., that an endolymphatic flow in a horizontal semi-circular canal directed towards the ampulla is accompanied by very definite horizontal nystagmus directed towards the stimulated ear. The mechanical nystagmic reflex is produced by pressure on the endolymph if there is a defect in the wall of the horizontal semi-circular canal. The rotatory nystagmus depends on the tendency of the endolymph to continue in motion after the sudden stoppage of rotatory movement of the body, causing increased pressure in one or other ampulla according to the direction of the rotation. The thermal nystagmic reflex depends on the currents produced in the vertical semicircular canals by the heating or cooling of the walls of the canals and the endolymph in contact with them, and the movements are vertical not horizontal.

As there was no reason to believe that there was any damage to the walls of the semicircular canals in the authors' case, they suggest that the condition was due to compression of the endolymph by the foot of the stapes through the fenestra ovalis. R. J. COULTER.

III.—BACTERIOLOGY.

(1) **Demaria, Enrique B.—Conjunctivitis from influenza.—Pfeiffer's bacillus.** *Anales de Oftalmologia*, Julio, 1907.

(2) **Ocampo, Gregorio.—Bacterioscopic diagnosis of conjunctivitis: its frequency in Mexico.** (Inaugural Thesis of the Faculty of Mexico.) *Anales de Oftalmologia*, Septiémbre, 1907.

(3) **Meyerhof.—On the ætiology of pseudo-membranous conjunctivitis observed in Egypt. (Sur l'étiologie des conjonctivites pseudo-membraneuses observées en Egypte.)** *Revue Générale d'Ophtalmologie*, 31 mars, 1909.

(4) Tchirkowsky.—A contribution to the study of the normal flora of the rabbit's conjunctiva and of the influence of the common conjunctival microbes on the eye. (Contribution à l'étude de la flore normale des conjonctives du lapin et de l'influence des microbes habituels de la conjonctive sur l'œil.) *Ann. d'Oculistique*, avril, 1909.

(5) Sandman, O.—Conjunctivitis and purulent inflammation of the excretory ducts of Meibomian glands caused by an encapsulated Gram-negative diplobacillus. *Arch. of Ophthal.*, July, 1909.

(6) Cramer, Max.—Bacillus subtilis in an orbital abscess. (Bacillus subtilis in einem Orbitalabszess.) *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1909.

(7) Calderaro.—The bacteriology of the conjunctiva before and after extirpation of the lacrymal sac. (Sulla batteriologia della congiuntiva prima e dopo l'estirpazione del sacco lacrimale.) *La Clinica Oculistica*, August, 1909.

(1) Conjunctivitis from influenza is due to the development *in situ* of Pfeiffer's bacillus, and may develop either as a complication of *grippe*, or as an independent affection, or it may precede the attack of influenza. The evolution and symptomatology of this form of conjunctivitis are peculiar, and now well-defined, thanks to the works of Jundell and of zur Nedden in 1900.

Demaria has observed a typical case.—M. C., Argentinian, 12 years old, antecedents unknown, had first one eye attacked, and on the following day the other; beginning abrupt, with smarting pain, œdema, and redness of the eyelids. On examination, œdema of the eyelids, which were reddish, intense blepharospasm, and photophobia; serous secretion with mucous flakes; conjunctivæ red and œdematous; corneæ unaffected; myosis; preauricular glands swollen and slightly painful; coryza and slight fever. Treatment by nitrate of silver, 2 per cent., and drops of cocadrenine effected a cure in four days.

Examination of the discharge by staining the secretion, fixed on an object-glass, with fuchsin solution, showed Pfeiffer's bacillus. There were seen fibrin nets, polynuclear leucocytes, and epithelial cells from the conjunctiva. Among the cells, and even inside the protoplasm, were seen Pfeiffer's bacilli. This bacillus is Gram-negative and takes fuchsin; it is seen isolated or in groups, and is very small (1. 2 μ × 0·5 μ), almost a coccus, with one end more rounded; it is easily distinguished from the Koch-Weeks' bacillus, which is thinner and finer throughout. Another distinctive characteristic of the two bacilli is that Koch-Weeks' disappears after treatment, or even spontaneously, while that of influenza persists. The cultures on ordinary media and on ascitic-agar and blood-agar, placed in an incubator at 37°C., gave colonies typical of influenza; at from 24 to 48 hours, transparent little drops are seen, like dew, which to a microscope of 60 diameters, are structureless. In cultures it is difficult to distinguished the bacilli of Koch-Weeks from those of Pfeiffer, and they have been thought to be the same; but with the microscope they can be distinguished, and the vitality of the two is distinct, that of influenza being more enduring and more capable of cultivation. Besides, pathogenesis is another diagnostic element: the Koch-Weeks' bacillus is only pathogenic for the human conjunctiva, while Pfeiffer's often attacks other organs. The Koch-Weeks' bacillus is not pathogenic for any animal, while Pfeiffer's is pathogenic for the monkey.

Conjunctivitis from influenza has a predilection for children, and it has even been known to produce an ophthalmia, similar to that of gonorrhœa, in children-in-arms.

J. DE J. GONZALEZ.

(2) **Ocampo** endeavoured to find out whether the bacterioscopic study of secretion from conjunctivitis agreed with the clinical diagnosis. With that object he studied the patients attacked by conjunctivitis who attended at the out-patient department of ophthalmology in the Central Dispensary of the City of Mexico. After indicating the technical course followed, and after studying minutely the different germs that produce conjunctivitis, the author presents the results he obtained from the examination of 33 cases :— Sex, 13 men and 20 women. Clinical diagnosis : acute conjunctivitis 23, sub-acute conjunctivitis 3, chronic conjunctivitis 2, and purulent conjunctivitis 5. Bacterioscopic diagnosis : Koch-Weeks' bacillus, 8 cases, Morax-Axenfeld, 18, gonococcus, 7, diphtheria bacillus, 1, no microbes, 2. The figures found by the clinical diagnosis do not agree with those of the bacteriological examination. Of the 23 cases of acute conjunctivitis, in 6 only was found the germ considered as its producer, the Koch-Weeks' bacillus, and of these 6, in 1 the diplo-bacillus of Morax was also found ; in the remaining 17 cases, 13 contained the Morax-Axenfeld diplo-bacillus, 2 none, another gonococcus and another that of diphtheria (?) It may be that in Mexico the Morax-Axenfeld diplo-bacillus is able to produce conjunctivitis which clinically bears the character of acute, since in an epidemic in the Foundling Asylum, after examining 6 cases, 3 gave the Koch-Weeks' bacillus and 3 the Morax-Axenfeld.

The cases which yielded no microbe had been treated antiseptically before the secretion was collected.

In 5 cases diagnosed as purulent ophthalmia, in all 5 the gonococcus was found, and, moreover, in one of them, the Morax diplo-bacillus. In one case, which did not present symptoms of purulent ophthalmia, the simple gonococcus was found.

In the sub-acute conjunctivitis, there also exists a disagreement between the clinical and the bacterioscopic diagnosis, for the Morax diplo-bacillus was associated with that of Weeks.

In two cases of chronic conjunctivitis the Morax-Axenfeld organism was found.

The author enters into statistics.—From February, 1905, to February. 1907, there came to the Central Dispensary 2,855 eye patients, 835 with conjunctivitis in all its forms, the contingent of conjunctivitis being, therefore 29.24 per cent. of the total of eye diseases. Cases of conjunctivitis, among themselves, are in the following proportion : acute 74·61 per cent. ; purulent conjunctivitis, 15·18 per cent. ; chronic, 4·19 per cent. ; phlyctenular, 3·35 per cent. ; follicular, 1·07 per cent. ; trachoma, 0·8 per cent. ; diphtheria, 0·3 per cent.

As regards the time of the year when most cases presented themselves, the author found a marked increase in May and August of one year, with exacerbations in January and October, which are attributed to the velocity of the winds and the absence of rain-fall ; and, indeed, the data which he has collected from the Central Meteorological Observatory tend to prove him to be right. J. DE J. GONZALEZ.

(3) **Meyerhof** (Cairo) examined 110 patients who presented all the symptoms of conjunctivitis with false membrane. He divides them clinically into three classes : (1) slight or catarrhal (10 cases) ; (2) severe or purulent (89 cases) ; and (3) conjunctival diphtheria (11 cases). Bacteriological examination showed :—

Koch-Weeks' bacillus	...	...	61 times.
Gonococcus	...	...	32 ,,
Streptococcus pyogenes	...	...	7 ,,
Loeffler's bacillus	...	...	5 ,,

In five cases, two of which are classed as diphtheritic, no infective agent was found. In 15 cases several of the above-mentioned organisms were present in the same false-membranes or one of them was associated with staphylococcus aureus or pneumococcus. The two last-named were never found alone, nor yet the Morax diplobacillus or the influenza bacillus. The majority of cases of pseudo-membranous conjunctivitis were caused by the Koch-Weeks' organism and the gonococcus. The former does not usually cause corneal complications, while, of course, the latter often does. The streptococcus and Loeffler's bacillus were found but rarely; the former, however, is most dangerous as regards vision. Examination of a table which accompanies the paper shows that in the 61 cases of Koch-Weeks' the cornea was affected eight times, in the 32 cases of gonococcus 17 times, in the seven cases of streptococcus ten times (eyes), in the five cases of Loeffler, five times. As regards blindness of one or both eyes, this occurred once, nine times, six times, and once in the respective classes.

The author gives details of cases in these different classes, and ends his paper with a few words on treatment. He believes in 2 per cent. nitrate of silver not only for purulent but also for pseudo-membranous cases, using protargol or argyrol in the intervals between treatments by nitrate. "I am of opinion that nitrate of silver has been wrongly accused of causing corneal complications, and I beg you not to be afraid of this useful drug. Severe streptococcic cases are always an exception, where no therapy is followed by immediate success." As regards serum treatment, he follows Morax in injecting 20 cubic centimetres in all cases of whatever age in which Loeffler's bacillus is not excluded by microscopic examination. ERNEST THOMSON.

(4) Although the rabbit is the animal which is most commonly used for experiments on the mechanism of infection of the eye, our knowledge as to the micro-organisms normally present in its conjunctiva is far from complete. With a view to remedying this defect, **Tchirkowsky**, of Kasan, has made, at the Institut Pasteur, a systematic bacteriological examination of the contents of the conjunctival sacs of 50 rabbits, and has investigated the pathogenicity for the different parts of the eye of the organisms which he found. As a result of his experiments, he forms the following conclusions:—1. The normal conjunctival sac of the rabbit contains a large variety of micro-organisms which differ from those present in the human conjunctiva by the rarity of the xerosis bacillus. 2. In addition to æröbes, there are also anæröbes, present in the healthy conjunctival sacs of rabbits, among which there are undoubtedly some which are pathogenic for the eye (*e.g.*, bacillus perfringens). 3. The pathogenicity of the microbes most commonly present is low, and it is only under particularly favourable conditions, especially the introduction of large quantities into the vitreous, that the germs develop rapidly, leading to consequences disastrous to the eye. For details, the original article should be consulted. R. J. COULTER.

(5) **Sandman** has discovered a Gram-negative bacillus which differs from the Morax-Axenfeld diplo-bacillus in that it has a distinct capsule, and will grow at 10°C. on all media. It differs from Friedländer's pneumo-bacillus by being larger, occurring more constantly in pairs, not producing gas and indol, and by the fact that suspensions of cultures of the Friedländer bacillus do not agglutinate with dilutions of the serum of the blood of rats inoculated with this new bacillus. It produces conjunctivitis and purulent inflammation of the excretory ducts of the Meibomian glands, and is best combated by acetozone, 1 : 1000, since the acetic acid liberated from this solution much retards the growth of the bacillus. ROSA FORD.

(6) **Cramer's** case was that of a boy who fell against a thorn hedge. A

thorn sticking in the skin of the upper lid was removed, but an orbital abscess formed slowly, and was incised about five weeks after the accident. At the operation no foreign body could be discovered. The wound, however, would not close, until after several weeks, a piece of wood was expelled from the orbit. The creamy-yellow pus was found to contain bacillus subtilis in pure culture. In animals inoculated with such a culture no suppuration took place, but it could be produced by inserting under the skin small pieces of wood infected with this micro-organism. C. MARKUS.

(7) It is well-known that an inflamed lacrymal sac constitutes a danger to operations, and on this account many surgeons remove all such sacs before undertaking an operation on the eye. It is not well-known how soon after such excision an operation may be undertaken with promise of success. These researches of **Calderaro** are of great importance, because they enable us to judge with some accuracy the length of time which must elapse before the conjunctiva loses its large bacterial flora.

The examination was made in ten patients, both before and after excision of the sac; and further examinations were made when some months had passed by. Not only the species and number of the individual bacteria were noted, but the virulence was investigated by the effect of the cultivated bacteria on animals.

Briefly, the results are as follow.—The bacterial content is always diminished after excision; the first few days show a marked diminution of the number of bacteria and a diminution of their virulence; if the eyes are kept tied up for some days, the bacteria increase in number and virulence. After the lapse of months, the conjunctiva, in most instances, shows to examination no pathogenic germs, but the usual saprophytes. When the eyes are kept tied up, the pathogenic germs reappear, but in diminished virulence, in about a third of the cases. After the eyes are kept occluded, the virulence increases.

Calderaro has not found division and probing of the stricture as efficacious in the diminution of the bacteria as removal of the sac. Removal of the lacrymal gland, with its resulting diminution of the tears, seems to favour the growth of pathogenic organisms. H. GRIMSDALE.

IV.—PATHOLOGY.

(1) **De Lieto Vollaro, A.—Contribution to the pathological anatomy of membranous formations of the lens.** *Annali di Ottalmologia*, Vol. XXXVI, 1907, Fasc, 5, p. 353 to 363, with two plates.

(2) **Orlandini, O.—Histological studies on cysts of the lacrimal passages.** *Annali di Ottalmologia*, Vol. XXXVI, 1907, Fasc, 6-8, p. 585 to 602, with one plate.

(3) **Cosmettatos, G. F.—Fibromatous transformation of a chalazion. (Transformation fibromateuse d'un chalazion.)** *Archives d'Ophtalmologie*, février, 1909.

(4) **Cosmettatos, G. F.—Congenital cyst of the conjunctiva. (Angeborene Zyste der Bindehaut.)** *Klin Monatsbl. f. Augenheilkunde*, August, 1908.

(5) **Cabannes.—A study of acquired serous cysts of the conjunctiva. (Étude sur les kystes séreux acquis de la conjonctive.)** *Ann. d'Oculistique*, T. CXL, p. 81, août, 1908.

(6) Thomas, Jerome B.—Perithelioma of the choroid and ciliary body. *New York State Journal of Medicine*, November, 1908.

(7) v. Michel.—On the macroscopic appearance of healed tubercle of the iris in man. (Ueber das makroskopische Aussehen der geheilten Iris-tuberkulose beim Menschen.) *Zeitschrift für Augenheilkunde*, Dezember, 1908.

(8) Levinsohn, G.—A contribution regarding the pathological anatomy and pathogenesis of glaucoma. (Beitrag zur patholog. Anatomie and Pathogenese des Glaucoms.) *Arch. f. Augenheilkunde*, Bd. 62, Dezember, 1908, Heft 2-3, S. 138-154. Illustrated.

(8a) Pusey, Brown.—Histological investigation of a case of blepharo-conjunctivitis caused by the diplo-bacillus of Morax-Axenfeld. *Trans. American Ophthalmological Society*, Vol. XI, Part III, and *Archives of Ophthalmology*, January, 1909.

(9) v. Michel.—On the anatomical changes found in a case showing the ophthalmoscopic picture of obstruction of the central artery of the retina as a result of direct injury to the orbit. (Ueber die anatomischen Veranderungen bei Entstehung des ophthalmoshopischen Bildes eines Verschlusses der Artina centralis retinæ infolge von direkter Verletzung der Augenhole.) *Zeitschrift für Augenheilkunde*, Februar, 1909.

(10) Wölfflin and Rupprecht.—On the histology of Parinaud's conjunctivitis. (Zur Histologie der Parinaudschen Konjunktivitis.) *Klin. Monatsbl. f. Augenheilkunde*, März, 1909.

(11) Ogilvy, A.—Microscopic section from a case of tuberculous iridocyclitis in a man, æt. 75 years. *Transactions Ophthalmological Society U.K.*, Fasc. 1, 1909.

(12) Alt, Adolf.—Note on a possible anatomical explanation of the nature of the so-called angioid streaks in the retina. *American Journal of Ophthalmology*, June, 1909.

(13) Weekers.—On the pathological anatomy of corneal ulceration caused by the Morax-Axenfeld diplo-bacillus. (Anatomie pathologique de l'ulcere cornéen à diplo-bacilles de Morax-Axenfeld.) *Ann. d'Oculistique*, juillet, 1909.

(14) Stirling, J. W.—A case of tubercular irido-cyclitis with organized exudate in the anterior chamber. *Ophthalmology*, Vol. V, July, 1909.

(1) An anatomico-pathological finding in the course of examination of an enucleated phthisical eye, gave **De Lieto Vollaro**, of Naples, the opportunity of studying the histological details of membranous cataract. It was the case of a flattened lens, not of a membranous new formation in the place of the lens, as the title would lead one to suppose. The question remains controversial whether the special elements of these regressive cataracts, the fusiform, mono-, or polynucleated cells, arise from hyperplasia of the anterior capsular epithelium, and from the neo-formative activity of cortical layers (Becker), or are rather the result of atrophic involution of the peripheral lenticular fibres. A. ANTONELLI.

(2) The essential points of the investigations carried out by **Orlandini**, of Venice, are as follow, but it should be remarked that they are

principally concerned with cysts of the lobules or excretory ducts of the glandular apparatus, and not with cysts of the lacrymal passages, properly so-called, as the title of the work would lead one to suppose. In the great majority of cases the pathogenesis of these cysts is undoubtedly to be attributed to mechanical retention. In some cases the origin is to be found in an organic lesion, probably infective, of the lobules themselves, with degeneration of the glandular parenchyma following an inflammatory process propagated by contiguity (oculo-palpebral mucosa) or through the circulation (blood or lymph). Occlusion of the excretory ducts of the principal glands or of the glands of Krause can be provoked by an inflammatory process of the conjunctiva, and the distension of these ducts and of these neighbouring lobules may form the cyst without any inflammatory alteration, properly so-called, of the glandular organ. When the contents of the cyst are essentially represented by degenerative products of the glandular parenchyma, it is a clear and transparent, or almost transparent, liquid containing albuminoids and salts. Broca's very complete quantitative analysis gives:—water 26·87 per cent., albumin 2·76 per cent., organic salts 0·76 per cent., fatty materials 0·78 per cent. This shows, as do the analyses which the author has obtained in two of his cases, the richness of the fluid in albumins. The ash yields chlorides, as a rule, more rarely phosphates. A. ANTONELLI.

(3) **Cosmettatos,** of Athens, begins by giving the views of various authors as to the histology of chalazion, and in doing so, glances at the tuberculous theory, as brought into prominence by Tagl and Wiehert. He then reports a case where fibrous tissue penetrated into the tissue proper of a chalazion, and thereby converted the latter into a fibromatous tumour. The growth, which had a history of six months and the dimensions of a small nut, was removed from the lower lid of a man, aged 31 years. Microscopically, it was made up of fibrous and granulation tissue. The abundant fibrous tissue towards the centre of the tumour formed loculi, occupied by granulation tissue. It contained connective tissue cells and giant-cells, as well as engorged vessels and smaller or larger hæmorrhages. In conclusion, Cosmettatos briefly discusses the diagnosis between chalazion, on the one hand, and chancre, lacrymal adenitis, Tenonitis, tuberculosis tarsi, epithelioma, sarcoma, adenoma, and fibroma, on the other. SYDNEY STEPHENSON.

(4) The patient of **Cosmettatos**, a student, aged 21 years, complained of a swelling underneath the left upper lid, which had been there since birth, but had increased in size lately. On everting the lid, a tumour was seen in the fornix, transparent, soft, pink, and the size of a filbert. It was dissected out, and found to extend into the orbit for $2\frac{1}{2}$ cm. The microscopical examination showed a large unilocular cyst, lined with a single layer of flattened cells, which was interpreted as an endothelium. The cyst wall consisted of a dense layer of fibrous tissue. On account of the endothelial lining the glandular nature of the tumour is rejected, and it is classed as a cystic lymph angioma. C. MARKUS.

(5) **Cabannes** describes three forms of acquired conjunctival cysts: lymphatic, glandular, and inclusion, and records an instance of each. He calls particular attention to the results of the cytological examination of the contents of the first two which showed that the lymphatic cyst contained a considerable number of leucocytes, chiefly lymphocytes, while the glandular one contained (1) large alveolar cells with vesicular or karyokinetic nuclei containing nuclear *débris* or fragments of red corpuscles, (2) polyhedral cells, (3) polynucleated leucocytes, (4) lymphocytes, and (5) free nuclei.

(6) The points of interest in **Thomas'** case are (1) the difficulty of

diagnosis of new growth when the case was first seen, (2) the rare character of the tumour.

When first seen, the patient, who was a healthy married woman of 34 years, with negative family history, complained of painless loss of vision in the temporal field of right eye. The pupils were found normal, there was no sign of inflammation of the globe, but behind the iris a smooth, brownish-red, non-fluctuating mass was seen. The tension was *diminished*, and the lower part of the retina detached, a fact which led to a hopeful prognosis, which had to be reversed and enucleation advised when transillumination had been employed. The patient refused operation, but returned in two months with pain, raised tension, and congestion of the globe. The eye was enucleated and the patient made a good recovery. Careful examination revealed no signs of new growth in the uterus or elsewhere. E. L. Oatman, in reporting upon the character of the tumour, concludes that it is a perithelioma of the choroid and ciliary body. In view of the rarity of this primary ocular tumour, a portion of Oatman's report may be quoted. "The exact histological position of this tumour is not readily determined. Apparently, it developed from the choroid, although the ciliary body cannot be ignored as a possible source of origin. It possesses a well-organized, angiomatous structure, consisting almost entirely of closely packed blood-vessels, the majority of which are of small size. A peculiar feature is the existence of large areas in which blood-vessels of capillary size run together in straight, parallel courses. The vessels are made up of a thin endothelial membrane ensheathed in tumour cells, so that the anatomical formation is a series of cellular tubes conveying blood. This structure constitutes an angio-sarcoma. The growth, however, differs from any ocular sarcoma which I have heretofore observed, both in the uniformity of its structure and character of the cells from which it is formed. The cells are of an epithelioid type. They are columnar or oval in shape, possessing rounded, often spindle-shaped nuclei, with abundant protoplasm. They grow in a radiate manner around the blood channels in immediate contact with the endothelial membrane; thus, vessels cut in their long axis present a foliate appearance, while in those cut transversely, cellular rosettes are seen which bear a superficial resemblance to those found in glioma retinæ. A moderate amount of granular pigment, both intra- and extra-cellular, is scattered throughout the growth. In some sections where cell proliferation is especially active, fusion of the cellular tubes has produced an appearance more nearly resembling ordinary sarcoma. The tumour is undoubtedly an angiosarcoma, but of a most unusual type. The predominant cell probably is derived from the perithelium of the blood-vessels. The growth, therefore, may be denominated a perithelioma, as distinguished from the ordinary round-celled angiosarcoma or tumours of endothelial origin." ERNEST THOMSON.

(7) **v. Michel** (Berlin). The paper, which is illustrated by a plate, describes the appearance of an old case of tubercle of the iris.

T. HARRISON BUTLER.

(8) **Levinsohn's** paper contains an account of the appearances found in a case of early glaucoma. Opportunities are rare in which the earliest pathological changes can be examined histologically. In this case the most striking change was a large deposit of pigment in the ligamentum pectinatum. Judging from the reports of a few other cases (which also mention pigmentation of the pectinate ligament) and his own, the author is inclined to regard the pigmentary changes as a frequent, if not a constant, factor in the ætiology of glaucoma. It has been shown that the pigment epithelium is very resistant to the destructive effects of increased intra-ocular tension, and yet in this case

the pigment was clearly seen to be epithelial in origin, some of the granules still being contained in epithelial cells. On searching for the origin of these cells, the author found the epithelium covering the most anterior ciliary processes detached He also observed hypertrophy of the interstitial tissue of the circular muscle fibres (muscle of Müller) of the ciliary body, and concluded that the epithelium had been pressed against the posterior surface of the root of the iris, and had been destroyed by the resulting pressure and disturbances of nutrition. Blocking of the spaces of Fontana with pigment, therefore, he considers to be one of the causes of acute glaucoma, the hypertrophy of the muscle of Müller and consequent displacement of the iris and narrowing of the anterior chamber, acting as a contributory and predisposing cause. This hypertrophy, he thinks, is analogous to senile hypertrophy met with in non-striped muscle elsewhere (hypertrophy of the prostate, myomatosis) and might be expected to be more common in hypermetropic eyes. PERCIVAL J. HAY.

(8a) An opportunity occurred in a man who died with his eyes in a condition of chronic blepharo-conjunctivitis for the whole tissue to be removed *post-mortem* and examined histologically. The case presented the typical features of the disease. **Pusey** (Chicago) found that at the lid edges and at the limbus epithelium ingrowths were present. He thinks the limbal ingrowths explain one mode of origin of circumcorneal "catarrhal" ulcers. The cells of the ingrowths necrose and show histologically a cyst-like process, clinically an ulcer. The limbal cells are active under all stimulation, *e.g.*, they are the most active in repairing injuries of the epithelial layer of the cornea, and this perhaps explains why these ingrowths occur. At the transitional fold the epithelial cells are greatly increased and show a marked tendency to mucoid change. The mucoid shreds *are seen attached to the mucoid cells to which desquamated cells and bacilli are adherent.* Bacilli are found only on the surface or between the superficial epithelial cells. They do not penetrate deeper. Pusey's results tally in every particular with Stock's, and, in addition, Pusey has found the bacilli, which were absent in Stock's specimens through the mode of preparation. Pusey agrees with Mayou that the new cells in the mucosa are plasma cells, not round cells, as Stock thought. Pusey does not find the cells directly beneath the epithelium broken up, as Mayou did. The glands of Krause are involved, and Pusey thinks that the infection of these glands may be persistent on account of their distance from the surface, and that this may be a source of reinfection. Pusey considers that he has proved the existence of the glands of Henle, since sections parallel to the surface of the conjunctiva showed tubules. ROSA FORD.

(9) **v. Michel** (Berlin).—The whole central vein was stretched and tense with blood. The artery was occluded by a hyaline thrombus. The extradural portion was twisted. The elastic layer was freely detached, and lay in the lumen of the vessel. A splinter of wood had entered the orbit, and the patient died of tetanus. The pathology of the case is minutely described.
T. HARRISON BUTLER.

(10) The case of **Wölfflin** and **Rupprecht** showed clinically the characteristic features of the disease, with which a voluminous literature has made us familiar. Some of the papillary excrescences, which were more in evidence than the follicular formations, were excised and submitted to microscopical examination. The chief finding was a very pronounced sub-epithelial round-cell infiltration, partly diffuse and partly in the shape of tubercle-like conglomerations. The centre of these was composed of lymphocytes and epithelioid cells, and surrounded by a mantle of plasma cells. A few atypical giant cells were found. The absence of typical giant cells and of

caseation and of eosinophile cells distinguish Parinaud's conjunctivitis from tubercle and spring catarrh respectively. Cell-necrosis, which some authors consider characteristic of Parinaud's conjunctivitis, was absent from the present case, possibly on account of the early stage of the disease in which parts of the conjunctiva were removed for examination. C. MARKUS.

(11) The points in **Ogilvy's** case are the age of the patient, the rapid destruction of vision—three weeks, and the fact that the tubercle was considered primary in the eye. ERNEST THOMSON

(12) **Alt** (St. Louis) presents some photographs of specimens from eyes with old choroiditic changes, in which he had removed a part of the retina, and in doing so had found streaks represented by folds of pigment epithelium cells, slightly raised by a small amount of exudation. The author suggests that these folds may give the correct anatomical explanation of the so-called angioid streaks. ERNEST THOMSON.

(13) **Weekers,** of Liege, found the following pathological appearances in an eye with extensive corneal ulceration, due to infection with the Morax-Axenfeld diplo-bacillus, which was removed ten hours after death from a man who had succumbed to tricuspid insufficiency.—The ulcer occupied the lower half of the cornea, and was covered by a mass of fibrin containing innumerable leucocytes, chiefly polynuclear, but many of them necrotic. Except for a few traces near the periphery, the epithelium was absent over the entire ulcer, which extended as far as the conjunctiva below, causing changes in its epithelium. At the upper margin of the ulcer the epithelium became gradually restored; first, scattered cells appearing; then, one and two rows; and, finally, a normal thickness with infiltration of leucocytes at the base. Bowman's membrane was destroyed throughout the entire extent of the ulcer, and at its upper border was reduced in thickness, while leucocytes could be seen passing through it in various places. The ulcerated corneal tissue was thinned by destruction of the lamellæ, and contained a very abundant infiltration of leucocytes, many of them polynuclear, disposed in two bands, one superficial and forming the base of the ulcer, and the other deep. At the points of greatest infiltration the corneal lamellæ were almost completely destroyed. The non-ulcerated corneal tissue shewed cellular infiltration, most marked superficially. Descemet's membrane was absent where the deep infiltration was most marked, but elsewhere was present and covered with endothelium, which was normal except at the level of the ulcer, where it was thickened, and consisted of three or four rows of cells. The anterior chamber was shallow, and contained a hypopyon consisting of polynuclear leucocytes. There were some small collections of leucocytes on the posterior surface of the cornea and the anterior surface of the iris, some slight infiltrations of the conjunctiva, iris, and ciliary body, and some collections of pigment in the iris, but the small amount of abnormality present in the other tissues of the eye, which was highly myopic, was remarkable, considering the severity of the corneal lesion. Sections stained with Unna's polychrome blue and other suitable colouring agents shewed numerous diplo-bacilli at the upper margin of the ulcer, amidst the infiltration, the epithelial cells, and the disorganised corneal lamellæ, and also in the superficial corneal lamellæ, forming the floor of the ulcer. Some of these were in pairs, but more usually they occurred as elongated bacilli of varying size, resembling the forms seen in cultures incubated for more than twenty-four hours. Owing to the tendency of diplo-bacillary ulcers to heal, opportunities of examining them pathologically very seldom occur, and the only other case which the author has been able to find in which such an examination has been recorded is one by L. Paul, in which the bacilli were not demonstrated in the sections.

R. J. COULTER.

(14) The following is a summary of **Stirling's** interesting case.—Mrs. E., 38, attended as an out-patient. Had a blow on the right eye, fifteen years ago, with complete recovery. Right eye now inflamed for six weeks, cornea steamy and semi-opaque, small hypopyon, iris details indistinct, marked pericorneal injection. No history of constitutional disease, but tuberculous family history on her father's side. Is married, and has two living children, one suffering from chronic enteritis. One child died in infancy. Under outdoor treatment, condition of eye got worse, hypopyon increased, deposits formed on Descemet's membrane. No pain even on pressure, tension minus, vision—hand movements. Patient admitted to the hospital, seven or eight weeks later, cornea more opaque and vascular, iris details invisible, anterior chamber opened and organised hypopyon removed, with rapid improvement in ocular and general condition, but vision amounted to light perception only. The mass of exudate, microscopically examined by F. T. Tooke, showed a framework of connective tissue fibres, containing in its meshes masses of leucocytes, chiefly small mono-nuclear. In places these formed definite tubercles with centrally situated epithelioid cells ; no tubercle bacilli found. Ten months later left eye was involved. Cornea diffusely opaque with areas of denser opacity in the deeper layers, tending to group themselves into rings. Slight hypopyon, tension minus, vision--hand movements, no tenderness to touch, Examination of lungs, negative during last residence, now gave evidence of mischief at right apex. Evening temperature subfebrile. Improvement of eye condition for a week or two followed by relapse, in the course of which five nodules appeared on the iris. Treatment with injections of old tuberlin guided by observation of temperature and opsonic index, steady improvement ; six month later, nodules gone and opacity much thinner.

A. J. BALLANTYNE.

V.—THE VISUAL FIELD.

Armaignac, H.—The measurement and the notation of the visual field. (Mensuration et notation du champ visuel.) *Archives d'Ophtalmologie*, octobre, 1909.

Armaignac, of Bordeaux, writes upon the measurement and notation of the field of vision.

The author points out that the limits of the field for white neither follow the conventional outline nor do they vary in extent according to this or that direction. On the contrary, the outline of the field for white is almost circular, while it extends to about 85 degrees in all the meridians which surround the fixation point. The limit, however, is not precise and mathematical, since it may vary for several reasons, such as the prominence or otherwise of the eye. It is, in fact, the prominence of the nose, the eyebrow, the malar apophysis, and the other parts around the orbit which causes the apparent variation in the peripheral limits of the field for white, such as are registered by means of the perimeter. The figures are always relative, and it follows that as they are below the normal, a pathological change must have reached a certain point before it can be demonstrated on the instrument. In order to measure the full extent of the field, the perimeter must be arranged in such a way as to allow the chin-rest to be turned upon its vertical, horizontal, and oblique axes, and thereby to eliminate the restrictive influence of the parts (nose, eyebrows,

malar prominence) surrounding the orbit. Such an arrangement, Armaignac says, while sometimes necessary in clinical work, is indispensable in scientific researches.

As to the representation of the visual field, the graphic chart may be employed, as usual, or it may be replaced by an adhesive chart. But in many cases these designs may be dispensed with, and the extent of the visual field may be entered upon the notes in a very simple way. The method may also be adopted in reporting cases, and the expense of a *cliché* be thus avoided. Gillet de Grandmont noted the four principal meridians—external, superi or, internal, and inferior—and indicated them by the formula E.S.I.I.—that is, by the initial letter of each meridian. If the visual field of the left eye, for example, measured in each of the meridians named respectively 90°, 45°, 40°, and 50°, he wrote: L.E.—E.S.I.I. = 90-45-40-50, or, more simply, indicated the tens only—E.S.I.I. = 9445. The greater the extent of the field the higher did this number become. Armaignac considers that de Grandmont's plan, although ingenious, is not of a very practical nature. He has therefore modified it. To begin with, he doubled the number of meridians measured, indicating as an index after each of the four chief meridians the numerical value of the intermediate sector. For example, the formula E.S.I.I. $9^{6}\ 4^{4}\ 4^{4}\ 5^{7}$ indicated that the visual field of the supero-external meridian was equal to 60°, the supero-internal meridian to 40°, and so on. The formula may be further elaborated by placing another index to the left of each of the chief figures, so as to indicate the value of the meridian which precedes the latter by 30 degrees. Thus, $^{8}9^{7}\ ^{6}5^{4}\ ^{4}4^{6}\ ^{7}8^{8}$. It should be noted that as regards the left eye the meridians are recorded clock-wise, while as regards the right eye the reverse is the case. The formula may obviously be expressed by lines radiating from the centre of a circle, each line having attached to it a number which indicates the value of the corresponding meridian, or by a simple cross, each extremity of which bears the value of three meridians.

SYDNEY STEPHENSON.

VI.—CONTRACTURE OF THE LEVATOR PALPEBRÆ SUPERIORIS.

(1) **Truc.—Retraction of the elevator muscles of the eyelids—division—cure.** (**Rétraction des muscles releveurs des paupières—Réculement—Guérison.**) *Ann. d'Oculistique*, T. CXXXV, p. 451, juin, 1906, and T. CXXXVI, p. 313, octobre, 1906.

(2) **Chaillous.—Contracture of the elevators of the upper eyelids with paralysis of elevation and of convergence. Elongation of the elevators.** (**Contracture des releveures des paupières avec paralysis de l'élevation et de la convergence. Allongement des releveure.**) *Ann. d'Oculistique*, T. CXXXVIII, p. 254, octobre, 1907.

(3) **Polack.—On monolateral contracture of the levator palpebræ superioris.** (**Contracture monolatérale du releveurs de la paupière supérieure.**) *Ann. d'Oculistique*, T. CXLI, p. 115, février, 1909.

(4) **Morax.—Unilateral spasmodic contracture of the upper eyelid dating from childhood.** (**Retraction spasmodic unilatérale de la paupière supérieure datant de l'enfance.**) *Ann. d'Oculistique*, T. CXLI, p. 121, février, 1909.

(1) **Truc**, of Montpellier, records the case of a man aged 60, who shortly after an attack of influenza accompanied by severe ocular pain, gradually became unable to shut his eyes. On examination, it was found that his upper eyelids were pulled upwards, so that their edges appeared to be turned in, while folds of skin hung down so as to cover the tops of the cornea. The condition was diagnosed as being due to retraction of the elevators of the eyelids, as there was no evidence of any general disease, and the skin, conjunctivæ, orbicularis, and ocular muscles were normal. Treatment with bromidia, injections of morphia, general anæsthesia, and electricity having been tried in vain, incisions were made along the upper margins of the tarsi and all the muscular attachments were divided through to the conjunctiva and up to the superciliary ridge. The patient was discharged completely cured two weeks after the operation, and came for examination two months later when his condition was still perfectly satisfactory. The second article consists of illustrations of the condition of the patient before and after operation. R. J. COULTER.

(2) **Chaillous** records the case of a woman aged 62, who suffered from contracture of the levator palpebræ superioris on each side preventing closure of the lids during sleep, and associated with abolition of all movements of elevation and convergence of the eyes, although the interni acted quite well in lateral movements. The lagophthalmos was relieved in each eye by separating the tendon of the levator from its attachment to the tarsus, dividing its middle third transversely from the fleshy part of the muscle, and longitudinally from each of the lateral thirds except in the immediate neighbourhood of the free extremity, and suturing to the tarsus the apex of the tongue of tendon thereby formed, thus elongating the levator by the length of the tongue. R. J. COULTER.

(3) **Polack**, of Paris, gives a detailed description of a case of contracture of the levator superioris of the left eye in a woman, aged 42, which had come on about two months before he first saw her in December, 1908, and remained unaltered for a period of 53 days during which he kept her under observation. Apart from the contracture, there was no ocular lesion, but Graefe's and Stellwag's signs were present, the pulse was rapid, the patient had rapidly lost flesh, her resistance to electricity was diminished, and there were slight tremors of the upper limbs. From these symptoms the author considers that the case was one of early exophthalmic goitre. R. J. COULTER.

(4) **Morax**, of Paris, records the case of a man, aged 47, with spasmodic contracture of the left upper eyelid which never caused him any inconvenience and which was stated to have existed from childhood. With the correction of slight myopia, the vision of each eye was normal, and there was good binocular vision, except on looking to the extreme right, when there was slight homonymous diplopia. There was no sign of exophthalmic goitre or other general disease. R. J. COULTER.

VII.—THE DIAGNOSIS OF SYPHILIS.

(1) Wolff, L. K.—**The serum-diagnosis of syphilis.** (**De serologische diagnosis van de syphilis.**) *Nederlandsch Tydschrift voor Geneeskunde*, 1908, p. 1761.

(2) Fleischer, Bruno.—**On the cytological examination of the cerebro-spinal fluid of patients suffering from eye diseases.** (**Ueber cytologische Untersuchungen der Cerebrospinalflüssigkeit bei Augenkranken.**) *Bericht der Ophthalmologischen Gesellschaft Heidelberg*, 1908 (volume published in 1909, p. 256.)

(1) **Wolff** gives the results of one hundred cases in which the reaction of Wassermann was tried. In general, the result of the reaction was in conformity with the data derived from examination in other ways: anamnesis, clinical observation, etc. With the exception of one case only, the Wassermann reaction pointed to syphilis, while the clinical symptoms were very strongly in favour of tuberculosis.

Wolff tried the serum of 11 persons free from syphilis; none of these showed the reaction. On the other hand, 17 patients suffering from syphilis in parts other than the eye, were tried. Of these, 13 showed a positive reaction. The author examined several cases of keratitis diffusa. Among these were 11 patients suffering from hereditary syphilis. Of these eight gave a positive reaction; the three others were negative, but these had already been treated with mercury for a long period. In three cases syphilis acquisita was the cause of the diffuse keratitis. One had been treated with mercury for a long time, and his serum gave a negative reaction; the two others gave a positive reaction.

Scleritis is now generally believed to be due to tuberculosis; in this opinion we are confirmed by the results of the serum-reaction, which in the vast majority of cases gives a negative result. The author gives one case where, however, clinical examination failed to give any hint as to syphilis, and where healing occurred rapidly under salicylic acid, but in which the Wassermann reaction was positive

In irido-cyclitis his results were as under: he examined the serum of 8 patients who showed marked symptoms of syphilitic iritis or irido-choroiditis, in 5 of these cases the reaction was positive, 3 gave a negative result, but this was more or less expected beforehand, as they had been treated with mercury previously. As a control, the author tried the reaction in 18 other cases of choroiditis of uncertain origin but in which syphilis could be excluded almost with certainty. Only one case gave a positive reaction.

Wolff's 15 other cases were different affections of the retina, optic nerve, and paresis of the eye-muscles. In all these cases the result of the reaction was such as could be expected from the clinical appearance of the cases. If syphilis was clinically certain, the reaction never failed, and in the cases where the reaction was negative, the clinical symptoms had not aroused a suspicion of syphilis.

From his results, Wolff thinks the great advantages of using Wassermann's method for clinical purposes are evident. G. F. ROCHAT.

(2) **Fleischer** (Tübingen) has investigated the cell content of the cerebro-spinal-fluid in cases of inflammatory disease of the cornea and uvea, in order to determine whether the presence of a leucocytosis is diagnostic of a syphilitic

ætiology. The fluid was withdrawn by lumbar puncture, and thoroughly centrifugalised. The solid residue was taken up with a pipette, placed upon a slide, and stained and counter-stained with Weigert's hæmotoxylin and eosin respectively. In 1903, Ravout showed that in the large majority of syphilitics the cerebro-spinal fluid contained an excess of lymphocytes. The normal fluid has been stated to contain no lymphocytes, but Widal finds two or three in each immersion-field, even in the healthy fluid. It is somewhat difficult to decide what is a true excess, but the author regarded those slides in which he could find fifty cells in the whole preparation as evidence of leucocytosis.

Thirty-five individuals were punctured, and 33 are included in the statistics. In many instances the blood was tested for the Wassermann reaction.

In the first series were 11 cases, of which 10 were clinically syphilitic and gave the Wassermann reaction. They included 8 cases of parenchymatous keratitis, 1 of iritis, and 1 of choroido-retinitis. In all the 10 a lymphocytosis was present, as it was in a case of parenchymatous keratitis, which was clinically syphilitic, but which did not give the Wassermann reaction.

In three cases there was a suspicion of syphilis, but the Wassermann reaction was negative. All shewed lymphocytosis.

Two other similar cases were not tested by Wassermann's method. Both gave a positive result when the spinal fluid was examined.

In 10 cases which are non-syphilitic both clinically and by Wassermann's method, 6 showed a lymphocytosis and 4 did not. Three other similar patients were not tested serologically. One was positive and two were negative as regards lymphocytosis.

To sum up.—In all certain and probable cases of syphilitic eye disease examined a lymphocytosis was found in the cerebro-spinal fluid. But in many cases which were practically free from specific taint lymphocytosis was also present. It is therefore quite obvious, Fleischer says, that the examination of the spinal fluid is of no value in deciding whether or not the eye disease has a syphilitic ætiology. Not only so, but in the presence of any inflammatory eye disease the presence of a leucocytosis cannot be taken as evidence of syphilis elsewhere, for the research has shown that the simple inflammation may induce it. On the other hand, the Wassermann reaction has proved to be absolutely trustworthy. T. HARRISON BUTLER.

VIII.—CHANCRE OF THE CONJUNCTIVA AND EYELIDS.

(1) **Angélis, Philippe.—Hard chancre of the inferior conjunctival cul-de-sac in a child of five years.** (Chancre induré du cul-de-sac inférieure de la conjonctive chez un enfant de cinq ans.) *La Clinique Ophtalmologique*, 25 septembre, 1908.

(2) **Rouvillois, H.—Syphilitic chancre of the bulbar conjunctiva.** *Revue Générale d'Ophtalmologie*, 31 juillet, 1909.

(3) **Cauvin, Ch.—Hard chancre of the eyelids.** (Du chancre induré des paupières.) *Archives d'Ophtalmologie*, octobre, 1909.

(1) The interesting points in **Angélis'** case are the age of the patient, confirmation of the diagnosis by appearance of secondaries, inability to trace the source of the infection, and the site of the infection. The chancre was hidden, and the early symptoms might have been mistaken for catarrhal conjunctivitis had not the unilaterality induced the author to examine carefully for a cause. The lesson is obvious. ERNEST THOMSON.

(2) **Rouvillois** describes a case of chancre of the bulbar conjunctiva. This is one of the rarest situations of ocular chancre, according to Fournier. Sourdille found only thirteen cases in the literature (1900). The present case is related with much circumstance, but may be summarised here :—The patient, a man of twenty-four years, saw Rouvillois a week after receiving a scratch on the eye by the finger-nail of a player at football. The appearances at this time of a red, œdematous, indurated, vertically placed ridge, presenting surface ulcerations, between the limbus corneæ and the caruncle of the right eye, combined with typical *bilateral* involvement of the preauricular, submaxillary, and cervical glands, led to a provisional diagnosis of primary syphilis. The mode of infection by a finger-nail, which is the only one admitted by the patient, is set on one side by the author with the remark that, as usual in extragenital chancre, the method of infection is obscure. There was complete absence of reaction on the part of the eye itself. Thirty-five days after the appearance of the primary lesion, secondaries confirmed the diagnosis. In diagnosing this interesting case, the author remarks upon the bilateral adenopathy which, he says, has not hitherto been specially taken notice of by writers. It is evident "that a communication exists in the middle line between the lymphatics of the right and left conjunctivæ. The anastomoses already recorded by anatomists who have studied the lymphatics of the nose, lips, tongue, and pharynx, have not, as far as I am aware, been described for the conjunctival lymphatics and seem to deserve further anatomical investigation." Regarding differential diagnosis of chancre of the conjunctiva, phlyctenular conjunctivitis, episcleritis, soft chancre, tuberculous ulcerations, and tumours cannot be confused with hard chancre of the conjunctiva. Secondary and tertiary syphilides alone present a certain analogy with it. Sourdille observed a case of secondary papular syphilide which could be mistaken for chancre. But secondary syphilides are not accompanied by the characteristic lardaceous infiltration. Conjunctival gumma is usually recognizable through the antecedents of the patient and the absence of adenopathy. Besides, as Fournier says, if conjunctival chancre is rare, gumma is rarer still. Two figures are intended to illustrate the appearances in Rouvillois' case : they might almost as well have been omitted. A coloured drawing would have been of real service. ERNEST THOMSON.

(3) **Cauvin,** of Nice, reports a case of Hunterian chancre involving the edge of the right lower eyelid of a child of ten months, and around this case he writes a good general account of chancres as they affect the lids or conjunctiva. **Frequency.**—Hard chancre of the eyelids is relatively rare. Fortuniadès reckoned that it formed about 1/20th of extra-genital chancres. Fournier noted 21 cases of palpebral or conjunctival chancres amongst 849 cases of chancres about the head or face, the so-called "cephalic" chancres. **Aetiology.**—It may occur at any age, but is most frequent between the eighteenth and thirtieth year. Even newly-born babies are not exempt, as witness Terson's case. The mode of contamination is often obscure. It is predisposed to by certain professions, as the medical, nursing, etc. Cases have been reported by Desmarres and Fournier where infection was conveyed to medical men by patients coughing into their eyes. Contagion may result from a bite of the eyebrow, the suction of a wound of the eyelids, or the act

of kissing. Other sources of infection include contaminated instruments, the projection of buccal or vaginal discharges, cleansing of the eyelids with saliva, removal of foreign bodies from the eye by the aid of a piece of cigarette paper moistened with saliva, and the use in common of objects, such as sponges, towels, handkerchiefs, basins, and water, which have been employed by syphilitic subjects. In a well-known case reported from Russia by Tepljaschin, a woman, whose business it was to remove foreign bodies by licking (*léchage*) the eye, managed to infect seven persons with chancre of the eyelids. The excoriations of blepharitis predispose to infection, particularly if they lead the patient to scratch the edge of the lids. **Symptomatology.**—A hard chancre is usually single, but Danlos has reported seven chancres contracted at the same moment. The lesion is more apt to occur on the border than on the cutaneous surface of the eyelid, and it is found somewhat more frequently at the internal than at the external commissure of the eyelids. It seldom causes much discomfort. The general characters of an indurated chancre are summed up by Cauvin as follows.—Its appearance at all ages, and the rapid effect of specific treatment. A single ulceration, with rounded edges, connected with a prominent and indurated base, which is often inflamed and œdematous. Constant adenopathy. As regards site, a chancre occurs in order of frequency in the following positions : on the free border of the eyelids, on the skin surface of the eyelids, opposite to the internal commissure, opposite to the external commissure, on the palpebral conjunctiva, and, lastly, upon the ocular conjunctiva. **Diagnosis.**—The Hunterian chancre may be confounded with soft chancre, styes, chalazion, ulcerous blepharitis, malignant pustule, leprous or tuberculous ulceration, gumma, and epithelioma. The specific lesion, however, is soon followed by secondary manifestations, the appearance of which places the diagnosis beyond doubt, while the spirochæta pallida may often be found in scrapings from the initial lesion. **Prognosis.**—As a rule, the parts affected by the chancre ultimately resume their integral condition. Complications, however, may arise. Thus, corneal ulceration, consecutive iritis, persistent induration, symblepharon, entropion, ectropion, and precocious interstitial keratitis have been recorded. The cephalic chancre is not believed to be more grave than chancres of other parts of the body. Interstitial keratitis, long after the chancre has run its course, has been reported by Snell, Collins, and Marlow. **Treatment.**—The chancre may be treated by antiseptic lotions or ointment, and local discomfort may, if necessary, be relieved by cocaine. Irritants must on no account be applied to the lesion. Cauvin favours an intensive mercurial treatment, carried out by means of intra-muscular injections.

SYDNEY STEPHENSON.

IX.—VACCINIA OF THE EYELIDS.

(1) **Wolff, L. K.—A case of vaccinia of the eyelids. (Een geval van Vaccinia der Oogleden.)** *Neder. Tydschrift voor Geneeskunde*, 1909, p. 739.

(2) **Herley, Randal.—A case of accidental vaccination.** *Medical Press and Circular*, 27th October, 1909.

(1) **Wolff's** patient was a child of three years, who one week after vaccination showed five pustules at the margin of the eyelids. At the same time the pustules of vaccination appeared on the arms. No harm resulted; the corneæ remained intact. In cases like this of generalisation of the vaccinia, there is usually a predisposition in the form of an eczema or some other illness. In Wolff's case, however, no such predisposition was present.

G. F. ROCHAT.

(2) Thirteen days after her infant had been vaccinated, **Herley's** patient, a woman aged 22 years, noticed some sores on her right nipple. On the following day, her left upper eyelid and the left side of her face began to swell. On admission a few (four) days later, temperature was 101° F. and pulse 90. There were three vaccine pocks on the right nipple. The right upper lid was swollen, and the conjunctiva was chemosed. An ulcer, with greyish floor and indurated border, lay on the margin and outer surface of the eyelid, close to the inner canthus. The cornea was clear. Under simple treatment, the ulcer healed, and eventually little trace of its existence was left beyond slight thickening of the skin and local loss of the cilia.

SYDNEY STEPHENSON.

X.—FIBROMATOSIS.

(1) **Valude.—Neuro-fibroma of the orbit developed from the frontal nerve. (Neuro-fibrome de l'orbite développé au dépens du nerf frontal.)** *Ann. d'Oculistique*, juin, 1909.

(2) **Nicolai, C.—A case of "Ranken Neurom." (Een geval van "Ranken Neurom.")** *Nederlandsch Tydschrift voor Geneeskunde*, 1909.

(1) **Valude's** patient, a woman aged 34, consulted him for a swelling below the left eyebrow, which had first been noticed ten years previously, and was growing slowly. It was painless, but caused a feeling of weight over the eye. On examination, a moderately hard tumour, the size of a bean, was found projecting from below the left eyebrow and extending in an outward direction to become lost in the depth of the orbit. There were no evident adhesions to the eye or the walls of the orbit. There was no exophthalmos, and the eye, which was normal, had full vision and perfect movements. The tumour was

dissected out and found to end posteriorly in a thin extremity which was cut. Healing was normal, but was followed by complete loss of sensation in the area supplied by the supra-orbital branch of the frontal nerve. At the end of two months there were still disagreeable sensations in the anæsthetic area, and the skin had become a little glossy, but the sensation of touch had returned. Microscopic examination of the tumour, which measured 3 cm. by 1 cm., showed that it was a typical neuro-fibroma. The condition appears to be a very rare one, as it is not mentioned in Lagrange's *Traité de Tumeurs de l'Œil*, and Valude has been able to find three cases only in which it is recorded.

R. J. COULTER.

(2) **Nicolai's** patient was unable to open his eyelids, so much were they tumefied by the formation of new tissue in their substance; this tumour-like tissue did not infiltrate the lids diffusely, but formed strands that, commencing in the eyelids, could be felt to run continuously under the skin of the forehead, and to disappear under the skin of the skull. As these masses prevented the patient opening his eyes, Nicolai tried to extirpate them. The operation, however, proved far from easy. The strands of tissue appeared to be continued in the depth of the orbit, and could not be removed completely. After the operation, in which as much of the tumour was removed as was possible, the growth reappeared, so that the patient was not in a much better condition than before. Microscopic examination showed that the tumour was chiefly built up of fibres resembling nerve tissue. A remarkable feature of the tumour was, that there were to be seen a large number of ring-shaped nuclei, well stained with haemateine; in the central part of these nuclei, a portion could be stained yellow with the van Gieson method. The author offers no opinion as to the nature of these particular formations. G. F. ROCHAT.

XI.—PRE-RETINAL HÆMORRHAGE.

(1) **Harms C.—On peripapillary pre-retinal hæmorrhage.** (**Ueber peripapilläre præretinale Blutung.**) *Bericht der Ophthalmologischen Gesellschaft Heidelberg*, 1908 (volume published in 1909, p. 294).

(2) **Benedke, Julius, v.—Further contributions to the anatomy of pre-retinal hæmorrhage with remarks on the boundary membranes between retina and vitreous.** (**Weitere Beitrage zur Anatomie der praeretinalen Hæmorrhagie nebst Bermerkungen über die Grenzmembranen zwischen Netzhaut und Glaskorper.**) von Graefe's *Archiv für Ophthalmologie*, Bd. 70, 2, April 13, 1909.

(3) **Klauber, Erwin.—Some histological peculiarities of pre-retinal hæmorrhage.** (**Einige histologische Besonderheiten der præretinalen Hæmorrhagie.**) von Graefe's *Archiv f. Ophthalmologie*, Bd. 70, 2, April 13, 1909.

(1) **Harms** (Tübingen).—A lenticular hæmorrhage in the macular region, which is generally reabsorbed, leaving no trace of its previous presence, is not uncommon. It has generally been held to be pre-retinal, between the membrana

limitans interna and the hyaloid membrane. In a case of Fisher's, which was examined microscopically, the blood was behind the membrane—that is, in the retina. Baquis and Harms have published examples of the disease in which the blood was internal to the retina. Harms now adds two more cases. In one of these, the blood covered the vessels and hid them all round the disc ; in the second, sections showed that it was chiefly internal to the membrana limitans interna, but partly external to it. The author believes that retinitis proliferans in the vast majority of cases is the result of a large pre-retinal hæmorrhage. The paper is illustrated by a wood-cut of the fundus of the first case, and by a plate giving a microphotograph of one of the sections obtained from the second case. T. HARRISON BUTLER.

(2) In reporting and sifting cases of pre-retinal hæmorrhage a distinction ought to be made between cases of a "pure" or uncomplicated nature and others where there are other changes due to hæmorrhage or inflammation. As might be expected, all anatomical reports belong hitherto to cases of the second group and **v. Benedek's** three cases are no exception to the rule. We must also distinguish between two classes of pre-retinal hæmorrhages according to their position relative to the membrana limitans interna retinæ; the pre-retinal site proper, between limitans and outer layer of vitreous, is quite the exception, and most cases occur within the retina and lead to detachment of the limitans from the conic terminals of Müller's fibres. In some cases v. Benedek found glossy bands over the hæmorrhage, due to a circumscribed detachment of the retinæ. R. GRUBER.

(3) **Klauber's** case of hæmorrhage was also, strictly speaking, retinal, as it originally took place between the layer of nerve fibres and the limitans retinæ, but the blood perforated into the vitreous. The hæmorrhage was very extensive, and led to a curious folding of the retina. R. GRUBER.

XII.—FAMILY DEGENERATION OF THE MACULAR REGION.

Stargardt, K.—On progressive degeneration of the macular region in several members of one family. (Ueber familiäre progressive Degeneration der Maculargegend des Auges.) von Graefe's *Archiv f. Ophthalmologie*, Bd. 71, Heft 3, September 21, 1909.

Stargardt, of Strassburg, thinks that this condition has never been described previously. It runs most remarkably in certain families. In one case all the children were affected, while in the other only two out of five escaped, one of them being only eight years of age, when the disease has yet rarely become marked. The parents were all normal, and not related by blood. The first symptom of the disease, which is very progressive, consists in a certain amount of irregularity in the pigmentation of the macular region. Later, small orange-coloured specks appear there, together with amorphous clusters of pigment, which fill the whole of the macular region or even extend beyond. At last we find an irregular greyish spot in the macula surrounded by a circle of pigmentation, and also sometimes by scattered yellowish spots or lines similar to those of retinitis albescens. The central vessels and the optic disc are slow

to show any signs of degeneration, but the latter is markedly paler in bad cases. The affection is remarkably symmetrical in both eyes. The vision is greatly impaired. There were no symptoms of congenital deformity, of syphilis, etc. Central scotoma was an early symptom, but colour perception was otherwise undisturbed.

R. GRUBER.

XIII.—RARE ANOMALIES OF THE IRIS.

(1) **Gilbert, W.—Contribution to the knowledge of rare anomalies of the iris.** (Weiterer Beitrag zur Kenntniss seltener Irisanomalien.) *Zeitschr. f. Augenheilk.*, Januar, 1907.

(2) **Stephenson, Sydney.—A curious congenital anomaly of the iris.** *Transactions Ophthalmological Society U.K.*, Vol. XXVIII, 1907-8.

(1) **Gilbert** describes three cases of rare anomaly of the iris. The first showed in the whole inner and outer part of the iris (about one-fourth of the iris) a large pigmented nævus. In the centre of this nævus, stretching from the pupillary border almost up to the root of the iris, was a coloboma of the anterior layers of the iris, the pigment layer apparently alone remaining, and there was also an ectropion of the pigment layer over almost the whole of the pupillary border. The second case was one where the iris appeared normal at first view. With oblique illumination, however, the lower half of the iris was seen to be much lighter in colour than the upper half, and with the ophthalmoscope the lower half was seen to be completely transparent; that is to say, there was a complete coloboma of the pigment layer. The third case was that of a patient who had an almost complete coloboma of the iris, up and in, in the left eye, and in the corresponding situation in the right an ectropion of the uvea. The eyes in all these cases were otherwise normal, with full visual acuity. The embryological significance of the anomalies is discussed.

A. LEVY.

(2) **Stephenson,** of London, reports the following curious anomaly seen in an infant:—"A small oval pupil lies in the upper nasal quadrant (right eye) at the junction of two very dissimilar structures: (1) a dull washed-out looking iris which occupies the major part of the anterior chamber; and (2) an arcuate strip of tissue of a light blue colour, which occupies the upper and inner part of the anterior chamber. The latter, the appearance of which is most unusual, appears to lie in a plane somewhat anterior to the iris tissue, and may even be on the posterior surface of the cornea. The impression conveyed to my mind is that it overlies the iris, and that if it could be removed iris tissue would be found behind it." The pupil was very small, responded somewhat to atropin, and permitted only a fundus reflex without details. There were no obvious changes in the left eye.

ERNEST THOMSON.

XIV.—PARASITES.

(1) Bocchi, A. — Extraction of a cysticercus from the vitreous. *Annali di Ottalmologia*, Vol. XXXVI, fasc. 12, p. 938.

(2) Lopez, Fernando.—Report of a case of sub-retinal cysticercus. *Anales de Oftalmologia*, Octúbre, 1907.

(3) Ross, Eliz. N. M.—Subconjunctival cysticercus. *British Medical Journal*, February 1st, 1908.

(4) Orloff.—A case of alveolar echinococci of the upper lid. (Un cas d'échinocoques alvéolaires de la paupière supérieure.) *Ann. d'Oculistique*, T. CXXXIX, p. 117, février, 1908.

(5) Oyenard.—Demodex folliculorum of the eyelid; its frequency and pathological significance. (Sobre la frecuencia y el valor patogeno del demodex folliculorum en los parpados.) *Archivos de Oftalmologia Hispano-Americanos*, Marzo, 1908.

(6) Gallenga.—An unusual ectoparasite of the skin of the lids. Ixodes Ricinus. (Di un ectoparasita poco frequente alla pelle della palpebra.) *Rivista Ital. di Ottal.*, August, 1908.

(7) Dor, Louis.—Sub-retinal cysticercus. (Cysticerque sous-rétinien.) *Archives d'Ophtalmologie*, septembre, 1908.

(8) Wernicke, Otto (Buenos Ayres).—Cysticercus of the vitreous humour. *Anales de Oftalmologia*, Octúbre, 1908.

(9) Gallemaerts, E.—Sub-retinal cysticercus. (Cysticerque sous-retinien.) *Bull. de l'Academie Royale de Mèdecine de Belgique*, octobre, 1908.

(10) Boulai, J.—A curious ocular parasite. Curieuse parasite de l'œil.) *La Clinique Ophtalmologique*, 10 mars, 1909.

(1) In a child of eight years, **Bocchi**, of Cremona, was able by incision of the membranes, to extract a cysticercus cyst which was lying in the lower part of the fundus. Injection of several drops of sublimate (1 : 2000) and electrolysis had failed to kill the parasite, on account of the difficulty of piercing the cyst with the needle. In order to avoid loss of vitreous, which was extremely liquid, the author had the brilliant idea of making a longitudinal supero-internal incision, drawing off a considerable quantity of vitreous into a glass syringe and keeping it in a water bath; then, after having extracted the cyst with forceps, and sutured the membranes, he re-injected the vitreous. There was very moderate reaction; hæmorrhage into the vitreous, which was afterwards absorbed; preservation of the eyeball with normal tension and vision equal to hand-movements at 30 cm.

A. Antonelli.

(2) In February, 1907, **Lopez** (Mexico) saw, for the first time, the wife of a distinguished physician, who, one month before, had noticed a shadow in the left field of vision. The patient—a strong, healthy woman—presented to the campimetric examination of the left eye a large scotoma. By the ophthalmoscope was observed a little yellowish-white spot, under and outside of the disc (inverted image), the rest of the fundus being normal. By careful examination, the author noticed that the little spot, whitish in general, had in the bottom a whiter point, circular, and with well-defined outlines; the distance of the spot from the optic nerve was a papilla diameter, and its

situation subretinal, because a vessel of the retina passed over it. To the upright image the spot was seen above and inside the papilla, and formed an eminence above the retinal level, for the refraction was different on the spot from what it was on a neighbouring point. The author thought it was a cysticercus, and, on inquiry, learned that the patient had eaten ham and other preserved meats; he administered a tape-worm purgative, and the patient expelled a tape-worm, *tænia solium*.

As the eye still retained fair sight, the author, in consultation with Ramos and Chavez, decided to wait; but, during the course of the next two months, the vesicle increased, broke the artery which passed over it, occasioning an extensive hæmorrhage and separation of the retina, considerably lowering the sight, until the latter was reduced to peripheral vision.

The author then decided to extract the vesicle. He made several trials on the *cadaver*, and after fixing the surgical *technique*, he proceeded, under chloroform, as follows: after having placed the blepharostat and pulled down the eyeball, he made, at one centimeter above the cornea and on the conjunctiva, a transverse incision a centimeter and a half in length; sought the tendon of the upper rectus, passed a strabismus hook under it and separated the muscle as far as possible, so as to leave it isolated from the neighbouring tissues; the tendon being fixed with an advancement forceps. Half a centimeter above its insertion, he made a section, with the scissors immediately below the forceps, the upper end remaining fastened; he passed, with curved needles, a thread, to each side of the muscle, so as to prepare the future sewing of the tendon, holding the ends of the thread with Péan forceps and removing the fixing forceps. With the same forceps the insertion end of the tendon was caught and the eye pulled strongly downward, making it execute a rotation sufficient to pull forward the posterior pole. The sclerotic was exposed as much as possible, and in this membrane was made, with a cataract knife, a meridional incision, one centimeter long, in the place where the cysticercus had been seen with the ophthalmoscope; the choroid was exposed and before opening it, so as to insure hemostasis, he instilled on it, separating the lips of the sclerotic wound with Stevens' tenotomy hooks, a few drops of normal adnephrine solution. He waited a little, strongly illuminated with an electric focus lamp the field of operation, made a small puncture in the choroid, completing the incision with very fine straight scissors, without hæmorrhage, only a little subretinal fluid escaping. When the lips of the wound were half-opened, the cysticercus was seen to appear and it was gently drawn out with a Levis spoon. Not a drop of vitreous humour escaped, as the retina was not opened. The lips of the sclerotic wound fell together; they were sutured with the same threads, the two ends of the tendon and the conjunctiva.

On examining eye with the ophthalmoscope immediately after the operation, the media were found transparent and without any extravasation of blood in the vitreous humour. A binocular bandage was applied, and was not changed till the tenth day, when it was applied to the healthy eye only.

Improvement continued, and at the time when the author publishes his observation, the central parts of the field of vision have bettered and large objects are seen. The ophthalmoscopic examination shows: transparent media, optic papilla slightly atrophied, vessels small, and a spot of atrophy of the choroid, and the sclerotic scar where the cysticercus was. The examination of the latter showed that it belonged to the tape-worm, *tænia solium*. J. DE J. GONZALEZ.

(3) **Ross's** patient, a Persian woman, aged 23, came to the dispensary complaining of swelling in the right eye, of one year's duration. On examina-

tion, a cyst was seen rising from beneath the lower eyelid, and extending from one canthus to the other. It rose one-eighth of an inch above the free border of the eyelid, and had fairly free movement under the conjunctiva. It was diagnosed as subconjunctival cysticercus, on account of (1) its thick and vascular walls, (2) its size, (3) its free mobility, (4) most important of all, a round, white, opaque spot on the anterior wall, stated by Sichel to be diagnostic of the condition. On the following day, cocaine having been administered, the cyst was excised. The wound healed by first intention.

(4) **Orloff** records the case of an otherwise healthy girl, aged 20 years, who came complaining of a swelling under the skin of the left upper eyelid, which had been noticed for the previous four months and was increasing in size. This was found to be due to a tumour, which, on removal, appeared to be a fibroma, the size of a date stone. On more detailed examination, however, it was found to contain a number of cavities of various forms and sizes presenting all the appearances of echinococcus cysts, although no scolices were demonstrated. The author refers to the researches of Melnikoff-Razwedenkoff as proving that such multilocular echinococcus cysts, even in the intermediate form, are capable of giving rise in human beings to innumerable germs capable of producing new foci by metastasis, and agrees with him that they should be called alveolar rather than multilocular. He claims special interest for his case, as all but 5 of the 250 cases of alveolar echinococci referred to by Melnikoff-Razwedenkoff[1] and Elenewsky[2] were hepatic. R. J. COULTER.

(5) **Oyenard**, as a result of the examination of a large number of cases, finds that the parasite is especially common in normal lids and concludes that it has no pathogenic power. The blepharitis acarica attributed to it by certain German authors was not observed by Oyenard in any case. It is possible, however, that the parasite may have some action, since it provokes dilatation of the mouths of the hair follicles and thus lays them open to the access of conjunctival secretion, which, carrying various micro-organisms, infects the follicles. The demodex is comparatively rare in cases under treatment for affections of the eyelids, and is probably destroyed by means of the commonly used antiseptic lotions and ointments. The sole important factor that Oyenard has discovered is age: the parasite increases in frequency with advancing years. HAROLD GRIMSDALE.

(6) **Gallenga** records the attack of the eyelid by a tick.

HAROLD GRIMSDALE.

(7) The case described by **Louis Dor,** of Lyons, was in a man of 35 years, who presented a sub-retinal cysticercus in the lower-outer periphery of the fundus of the right eye. The diagnosis was endorsed by Dor *père*. As a curative agent, it was determined to employ electrolysis. Under ophthalmoscopic control, the cyst was punctured through the sclera by a Graefe knife, and without withdrawing the latter, a small electrolytic needle was slid along the blade of the knife into the cyst. The needle was then connected with the positive pole and the negative pole was placed between the shoulders of the patient. A progressively stronger current, eventually reaching five milliampères, was allowed to flow for five minutes, and was then slowly reduced. When the dressing was removed on the third day, vision was 0·3 (before operation it had been 0·25), and in full daylight there was no limitation of the field. Diplopia with superimposed images, corrected by a prism of two degrees base down, supervened at a later period, and was still present when the patient was last heard from, seven months after operation.

SYDNEY STEPHENSON.

[illegible] Charkoff, 1909.

[illegible] Charkoff, 1904.

(8) In Argentina cysticercus is rare, while echinococcus is frequent, which is due to the fact that the flesh of the pig, in which the tænia solium, tape-worm, lives in a cystic state, is little used as food.

M. M., 25 years old, Italian, and married, had lived in Argentina for five years. Healthy till June, 1907, noticed, then, in her left eye a fine thread, like a hair, which grew till it took the form of a lentil; at the end of two months it completely covered the sight. She then noticed that it took the form of a clove and that it had movements of extension and retraction.

Examination.—Cornea, anterior chamber, and iris, normal; crystalline lens transparent. Dilating the pupil with atropine, a blue reflection is seen in the upper part. With the ophthalmoscope is seen, in the upper interior part of the vitreous humour, a vesicle with iris-coloured borders (red, golden, and blue), of a dark colour, of the size of the crystalline and without vessels on its surface. This vesicle has, on its lower part, a white spot, near which is seen the neck and head of the cysticercus, lodged within the vesicle, and moving. The ventors and rostel are clearly seen. The vesicle makes movements when the eye moves. The remainder of the fundus of the eye seems normal. V. = light. After some days, the cysticercus can be seen by the naked eye in the pupillary field. An unsuccessful attempt was made to extract the cysticercus through a sclerotic incision. The author reviews five cases of cysticercus published in his country, and announces that Demaria will publish another case of cysticercus of the orbit which, with his, will make seven.

J. DE J. GONZALEZ.

(9) **Gallemaerts**, of Brussels, reports a case observed in a pork butcher of 24 years, whose sight began to fail at the same time that he discovered he had a solitary worm. The vision fell insensibly, and then suddenly it fell in two days. When examined, the patient could scarcely count fingers at 50 cm. There were fine vitreous opacities, and the optic disc was red and badly-defined, especially below and within. A whitish band, directed outwards, arose from the temporal border of the papilla. The retina was detached externally and below, particularly in the latter situation. A rounded vesicle, with bluish edges, endowed with movement, could be recognised in the lower part of the fundus. The visual field was lost everywhere except in its infero-external part. The cysticercus was localised as lying in the vicinity of the lower border of the right external rectus muscle, at the level of the equator. After incision of the conjunctiva between the right external and the right inferior rectus, the eyeball was drawn downwards. A catgut suture was placed in the sclera, and an incision 1 cm. in length was made. The cysticercus escaped suddenly while the two lips of the wound were drawn apart. The sclera was sutured with catgut, and the conjunctiva with silk. Five days after operation the visual field had enlarged considerably, especially within; the sight was 1/50, and a detachment existed in the infero-external segment of the retina. Thirteen days after, the head of a second cysticercus was seen beneath the retina. It is interesting to note that the blood, analysed the evening before the operation, showed 7·5 per cent. of eosinophiles, a proportion which had fallen to 0·5 per cent. six days after the operation.

MARCEL DANIS.

(10) One can imagine the speechless astonishment of **Boulai**, when on incising a little scleral tumour, situated close below the lower corneal margin, with a view to its ablation, there emerged therefrom "a little pink larva one centimetre long, and provided with feet; it fell upon the patient's cheek, remained stationary for a few seconds, and then set off to walk over the sterile compress which protected the face and head of the patient."

The larva was sent to Professor Houlbert, who pronounced it coleopterous,

and either a larva of larynetes or of necrobia. To the best of the professor's knowledge, no such case has hitherto been published.

The patient was a farm servant. Now necrobia lives among carrion, old bones, and detritus of all sorts. It is supposed that having an eye constantly itchy (owing to the presence of another small tumour of congenital origin, for which, indeed, she originally consulted Boulai), the patient had, with dirty hands, introduced the eggs of necrobia into the conjunctival sac.

It is stated that a full account of the larva by Professor Houlbert is to be found in the proceedings of the *Entomological Society of France*, but the exact reference is not given. ERNEST THOMSON.

XV.—ARGYROSIS.

1. Sommer, G.—**On argyrosis of the conjunctiva in general argyria.** (**Zur Argyrose der Augenschleimhaut bei allgemeiner Argyrie.**) *Wochenschrift fur Therapie und Hygiene des Auges*, 11 Juni, 1908.

2. Hirschberg, J.—**On silver staining of the sclerotic and the skin of the body.** (**Versilberung des Weiszen in Auge und der Körperhaut, eine seltene Gewerbekrankheit.**) *Centralbl. für prak. Augenheilk.*, März, 1909.

(1) **Sommer's** case was a fellow-guest in a hotel at a spa, who had been often his *vis-à-vis* at table. The cause of the argyrosis had been a lengthy treatment with silver nitrate. The face and hands were stained to a characteristic moderately dark, dirty bluish-grey, diffuse, but still somewhat irregular, colour. The mucous membranes and the bed of the nails had a lighter slatish-grey pigmentation, in which the conjunctiva shared. The buccal membrane was of a darker shade. The entire body seemed affected. The impregnation was most marked on the most exposed parts. W. B. INGLIS POLLOCK.

(2) **Hirschberg**, of Berlin, has met with a case of a man who for 59 years has been occupied in polishing silver with the oxide of iron, and in this man both sclerotics were stained a dark grayish-blue, the face was of a grey-violet colour, and the hair, which was originally dark-brown, had become grey, and was now yellowish-red. All this discolouration was probably due to the fine particles of silver dust which had been driven with considerable force against this man's face for so many years. A. LEVY.

XVI.—SEROUS MENINGITIS.

Muskens, L. J. J.—**The significance and treatment of serous meningitis.** (**De beteekenis en de behandeling van Sereuze Hersenvlies ontsteking.**) *Nederlandsch Tydschrift voor Geneeskunde*, 1909, p. 1162,

Muskens calls attention to the fact, that the symptoms of a tumour of the brain can sometimes be presented by cases of serous meningitis. In these cases marked swelling of the papilla is often found, and it is quite impossible to distinguish between brain-tumour and serous meningitis. But the

latter can heal spontaneously, or after trepanation of the skull, the symptoms of choked disc may disappear completely, or atrophy of the papilla may follow. Generally speaking, the author recommends strongly the operation of trepanation in all cases of increased intra-cranial pressure. For it is just as much indicated in brain tumour as in serous meningitis. In the first-named affection, trepanation prevents, or at least postpones, blindness ; but in the latter it often has the value of a radical operation. In Muskens' opinion, serous meningitis is not infrequent, and most of the cases seem to occur in young children. On examining the pupils of the Institute for the Education of the Blind in Amsterdam, the author, to his surprise, found in about twenty per cent., the blindness due, not to any disease of the eye itself, but to cerebral disease with increased intracranial pressure in their youth, followed by optic atrophy. The author thinks it right to assume that these were cases of serous meningitis. Trepanation in this disease being so often capable of curing it, and of preventing blindness, he calls the special attention of the general practitioner to these facts. G. F. ROCHAT.

XVII.—DIABETIC AFFECTIONS OF THE EYE.

(1) **Brunetière. — Diabetic iritis.** (Notes sur l'iritis diabétique.) *L'Ophtalmologie Provinciale*, février, 1909.

(2) **Roberts, W. H.—A case of transient cycloplegia due to glycosuria.** *Archives of Ophthalmology*, July, 1909.

(1) **Brunetière,** of Bordeaux, reports a case of acute iritis occurring in a diabetic, and considers it undoubtedly due to the diathesis alone, all other causes being absent. The patient was a woman of 60, who had had glycosuria for 10 years, but had neglected to observe the diet prescribed by her medical man. For some months before consulting Brunetière, vision in both eyes had steadily diminished, and she had suffered from headaches and photophobia. When first seen vision was : R.$\frac{1}{50}$, L.$\frac{1}{10}$; slight myopia, double retinitis characterised by greyish white streaks at the macular regions, with small discrete hæmorrhages along the vessels, all more marked in the right eye. The patient was referred to her medical man for general treatment. Three days later the right eye became red, painful on pressure, and the seat of acute shooting pains ; she suffered from sickness and was unable to sleep. Some six days from this she was brought a second time and found to be suffering from an intense iritis, with exudates occupying the lower two-thirds of the pupillary area. The urine was found to contain 38·5 gm. per litre of sugar and ·7 of albumen. Treatment consisted of artificial leeching, iced-pads, atropine, adrenaline, and dionine, strict anti-diabetic diet, and anti-pyrine. In 15 days from the onset of symptoms the patient was well, sugar having fallen to 15·6, and albumen to ·18 per litre ; vision was R.$\frac{1}{10}$, L.$\frac{2}{10}$; no change in the ophthalmoscope appearances. The following points are brought forward as being of special interest :—the slow and insidious onset of the affection, with an exacerbation reaching its maximum in from 24 to 48 hours, the abundant fibrinous exudate, and the degree and extent of the pain which reached from the nape of the neck to the dental arch of the superior maxilla on the same side. The writer considers that diabetic iritis is more common than the small number of cases published would suggest, and that a systematic urinalysis

would probably shew this. He refers to statistics, and remarking that though Badel found only 3 cases in 20,000 patients, Leber found in Ebstein's clinic diabetic iritis diagnosed 9 times out of 39 cases of glycosuria, and Galezowski 7 cases in 144 of iritis. In company with the last-named, Venneman and Lagrange, Brunetière thinks that out of every hundred cases of iritis, 5 or 6 might be put down to diabetes. A table of the cases published in France since 1863 is given as follows :—

Year	Observer	Diagnosis	Sex	Age	Sugar per litre	Other Ocular Lesion
1863	Demarquay (in Marchal de Calvi)	Iritis	F	50	–	Choroiditis
1869	Noyes	Double iritis	F	60	Large amount	Retinal hæmorrhages in left eye
1874	Wickersheimer	Iritis L.E.	M	37	203 gm.	Choroiditis
1881	Ullmann	Iritis R.E.	M	69	Large amount	Hypopyon
1883	Condouris	Iritis R.E.	M	54	62 gm.	
1883	Galezowski	Iritis (?)	M	35	80 gm.	Hæmorrhagic retinitis and glaucoma
1883	Galezowski	Iritis (double)	M	60	90 gm.	
1883	Abadie	Iritis (double)	F	28	enormous quantity	Irido-choroiditis with glaucoma and cataract
1886	Badal	Iritis L.E.	M	56	22 gm.	Suppurative keratitis and hypopyon
1886	Badal	Iritis L.E.	F	51	60 gm.	Serous choroiditis
1886	Badal	Iritis R.E.	F	56	definite amount	Choroiditis and glaucoma
1805	Koenig	No information.				
1895	Koenig					
1868	Gallemaerts	Iritis L.E.	M	55	76 gm.	Keratoconus in right eye
1668	Brunetière	Iritis R. & L.	F	60	38 gm.	Hæmorrhagic retinitis right and left

BERNARD CRIDLAND.

(2) A man of 51 years whose urine a fortnight previously had contained 7 per cent. of sugar, complained of inability to read with his glasses, which had, until a few days before, been perfectly satisfactory. At the time, the urine contained as a result of treatment only $\frac{3}{8}$ per cent. sugar. An increase of +2·25 D. was found to be necessary. A month later this was reduced 1.75 R.E. and 1·25 L.E. A report received some 9 months later shewed that the paralysis of accommodation had gradually disappeared *pari passu* with the improvement in the patients general condition, and that he then was wearing his original glasses again. Roberts compares the case to those of post diphtheritic cycloplegia, and thinks a similar toxin may have been the cause.

ROSA FORD.

XVIII.—PERMANENT DRAINAGE OF THE LACRYMAL PASSAGES.

(1) **Koster, W.**—Further information about the permanent drainage of the lacrymal passages. (Nadere eruariagen omtrent de permanente drainage der traanwegen.) *Nederlandsch Tydschrift voor Geneeskunde*, 1908, p. 2025.

(2) **Nicolai, C.**—Permanent draining of the tear-passages. (Permanente drainage van de traanwegen.) *Nederlandsch Tydschrift voor Geneeskunde*, 1909, No. 5.

(1) **Koster** has treated a large number of cases with his new method of draining the tear passages, an account of which was published last year (*see* THE OPHTHALMOSCOPE, 1908, p. 47). This method consists in passing a silk thread through the canal, and, catching the end in the nose, drawing it out from the nostril and tying this end to the one protruding from the punctum; this thread, left in position for some time, secures a very good and permanent drainage. The insertion of the thread into the lacrymal canal is greatly facilitated by having one of its ends stiffened by impregnation with a solution of gum Arabic and letting it dry (an improvement suggested by Brand, of Sluis). The patients are very little inconvenienced by the presence of the thread, the only objection being the unusual appearance the patient offers with the thread lying on his cheek, one end of which is pending from the nostril, and the other disappearing in the lacrymal point. A small strip of flesh-coloured plaster, however, makes this less visible, and, as a rule, the patients do not object to this slight and temporary disfiguration when they expect to be cured of their not less objectionable lacrymal disease. The history of a good many patients treated after the method is given, from which the excellent prospects of the treatment can be deduced. The gum-impregnated thread once inserted in the duct, its extremity is quickly softened by the moisture in the nose and can be brought outside either by the patient violently blowing his nose, or by inserting a small hook under the inferior concha and catching the thread with it. This is generally a very easy matter, even to a surgeon not familiar with intra-nasal manipulations.

(2) **Nicolai** has tried Koster's method for the permanent drainage of the tear passages, and is very well satisfied with the results. He used the method in its first published form, in which a loop of thin copper wire was inserted in the lacrymal duct through a hollow probe. The extremity of the loop was then caught under the concha inferior with a pincette specially devised for this purpose by Nicolai. When the end of the loop was well brought outside the nostril, a piece of silk was inserted through the loop and the latter was drawn back through the lacrymal duct, taking the thread with it. After removal of the hollow probe, the two ends of the thread were tied together. (As can be seen in the foregoing abstract (1), the method has lately been very much simplified by the use of a thread stiffened with gum Arabic).

Drainage with the silk thread has yielded in Nicolai's hands very good results, as may be seen from the history of the many patients given in the paper. Among his cases there were a few very rebellous ones in which probing of the duct had been performed for years without any improvement, that were permanently cured by the Koster method. The thread can remain in the duct for many weeks continuously without discomfort to the patient, and is no obstacle to syringing the duct. If previously there was any discharge from the sac, this is rapidly stopped after good drainage has been secured by the insertion of the thread.

G. F. ROCHAT.

XIX.—TUBERCLE OF THE CHOROID.

(1) Stephenson, Sydney.—? Intraocular Neoplasm. ? Tubercle. *Trans. Ophthalmological Society U.K.*, 1906, p. 96.

(2) Taylor, E. Claude, and Thompson, A. Hugh.—Tubercular tumour of the choroid. *Ibidem*, 1906, p. 98.

(3) Cargill, L. V. and Mayou, S.—A case of general miliary tuberculosis in an adult in which choroidal tubercle with implication of one optic disc was the only physical sign in the early weeks of the illness. *Ibidem*, 1906, p. 101. (*Abstracted in* THE OPHTHALMOSCOPE, 1907, p. 666.)

(4) Snell, Simeon.—Tubercle of Choroid. *Ibidem*, 1907, p. 156. (*Abstracted in* THE OPHTHALMOSCOPE, 1908, p. 198.)

(5) Tay Waren.—Tubercle of the Choroid, the discovery of which led to the diagnosis of tubercular disease. *Ibidem*, 1907, p. 159. (*Abstracted in* THE OPHTHALMOSCOPE, 1908, p. 199.)

(6) Cargill, L. V.—Solitary quiescent ("obsolescent") tubercle in the right eye, associated with tubercular glands in the neck. *Ibidem*, 1907, p. 164. (*Abstracted in* THE OPHTHALMOSCOPE, 1908, p. 199.)

(7) Stephenson, Sydney.—A case of Tubercle of the Choroid. *Ibidem*, 1908, p. 35.

(8) Clarke, Ernest and Wright, Sir Almroth.—Solitary or conglomerate tubercle of the choroid treated by tuberculine. *Ibidem*, 1908, p. 192. (*Abstracted in* OPHTHALMOSCOPE, 1908, p. 1002.)

(9) Carpenter, George.—A further clinical contribution to the study of tubercle of the choroid. *Ibidem*, 1909. Fasc. 3.

The following is a synopsis of recent articles dealing with cases of tubercle of the choroid, published in the *Transactions* of the Ophthalmological Society of the United Kingdom.

(1) **Stephenson's** case was of a boy of 9 years who presented a smooth, non-tremulous, steep detachment of the retina in the upper fundus, and a simple detachment of the retina below. Nature of case doubtful.

(2) Case of a female of 22 years with tuberculosis in many parts. Sight began to fail in April, 1905; cyclitis and detachment of retina followed. On July 15th, 1905, the eye was enucleated. The tumour was white, extended from the ciliary body two-thirds the way to the disc, and 5 mm. into the interior of the globe. Section showed numerous giant cells and a complete absence of blood-vessels. The eye symptoms in **Taylor** and **Thompson's** case developed when the tuberculosis was being got rid of.

(7) This case, **Stephenson** (London) says, attests the truth of the observations made by himself in association with George Carpenter, that tubercle of the choroid may be found at any stage and in any kind of tuberculosis, and that tubercle of the choroid is not infrequent in association with chronic medical and surgical tuberculosis. When such patients live long enough, the choroidal lesions pass through the usual changes, and when seen years afterwards, betray their former existence by a scar in the choroid, which Stephenson and Carpenter have called "obsolescent tubercle." This particular case is that of a woman of 35 years, with no special

personal history pointing to tubercle, but with a very suggestive family history. The most interesting point in the family history is that a sister of the patient was under Stephenson's care in 1898 suffering from irido-cyclitis, and from what was believed at the time to be tubercle of the choroid. This choroidal tubercle has, after nine years, been replaced by an atrophic pigmented area—"obsolescent tubercle." The patient, then, after complaining of "mistiness" of, and "smuts" before her right eye for a fortnight, was found to have a distinct degree of irido-cyclitis. She was examined by Carpenter, in order to determine, if possible, the constitutional basis of the irido-cyclitis. Tubercle could not be affirmed, though there were some enlarged glands, nor yet syphilis, nor rheumatism; but a positive Calmette was obtained. Several days later the posterior corneal deposit having diminished, the fundus was found to present (as shown in a plate) a soft-edged, ill-defined, greyish-white area lying beneath the superior temporal vein $\frac{2}{3}$ P.D. above and a little to the outer side of the O.D. The anterior chamber was then tapped and a very few acid-fast, rod-shaped bacilli were discovered in smears of the aqueous. General health remained good. The diagnosis of choroidal tubercle was founded on the following evidence:—(1) The ophthalmoscopic appearances. (2) Presumably tuberculous glands existed in the neck and elsewhere. (3) The case of her sister already mentioned. (4) Tubercle bacilli in the aqueous. (5) Positive Calmette reaction. It could scarcely be doubted, says Stephenson, that the ophthalmoscopic changes represented a metastatic infection from a focus of tuberculosis in some other part of the body, presumably in this case the lymphatic glands. Yet this patient presented no other symptoms of importance *quâ* tubercle.*

(9) **Carpenter's** article, which includes a minute clinical description of five cases of miliary tubercle of the choroid, illustrated with drawings of the fundus, is, in essence, a plea for the contentions put forth by himself and Stephenson in 1901, "that tubercle of the choroid may be met with in any form of tuberculosis, whether acute, chronic, or obsolescent," and that the similarity in appearance of chronic syphilitic and tuberculous choroiditis renders it a matter of diagnostic weighing of evidence in order to decide whether a given case belongs to one category or the other. Just as the grosser syphilitic and tuberculous lesions of the fundus oculi are indistinguishable in their early stages, so, in like manner, it is impossible to separate the syphilitic and the tuberculous in the atrophic stages by their ophthalmoscopic appearances alone. Carpenter claims that choroidal tubercles are common (if carefully looked for in all cases of medical tuberculosis), and that the recognition of them often makes it possible to come to a rapid and correct decision in doubtful cases, and renders unnecessary, in some cases at least, the employment of lumbar puncture, leucocyte counts, and tuberculin as an aid to diagnosis. Other points emphasized by the writer are that the presence of choroidal tubercles does not necessarily indicate generalised tuberculous infection; that miliary tubercle of the choroid is generally central, solitary, small in size, and uniocular; and that advance in knowledge is more likely to be made by recognising tuberculosis as an important and not uncommon factor in the causation of chronic choroiditis, than by adhering to the conventional view that such a condition must necessarily be syphilitic, no matter what the evidence may be to the contrary.

ERNEST THOMSON.

*Stephenson's patient is still in good health, and the appearances in the fundus are now typical of obsolescent tubercle. She will be shown at some future meeting of the Ophthalmological Society.

XX.—RECURRENT EROSION OF THE CORNEA.

(1) Cuperus. N. J.—On so-called recurrent abrasion of the cornea. (Ueber sogenannte recidivirende Erosio Corneæ.) *Arch f. Augenheilkunde*, August, 1908.

(2) Curdy, R. J.—Recurrent traumatic erosion of the cornea. *Trans. Amer. Ophthal. Society*, Vol. XI, Part III, 1908, p. 594.

(1) **Cuperus** regards the condition known as recurrent abrasion of the cornea as a superficial ulcer, which has been covered imperfectly with epithelium. Focal illumination with artificial light shows that in these cases the base of the ulcer still stains with fluorescein, although to all appearance the defect is healed and does not stain with fluorescein when examined in ordinary daylight. In all cases the author recommends bandaging as a routine prophylactic measure until fluorescein stains no longer.

PERCIVAL J. HAY

(2) The symptoms in the case of recurrent traumatic erosion of the cornea reported by **Curdy,** of Kansas City, ceased upon cure of a long-standing lacrymal obstruction. SYDNEY STEPHENSON.

XXI.—PIGMENTATION OF THE OPTIC NERVE.

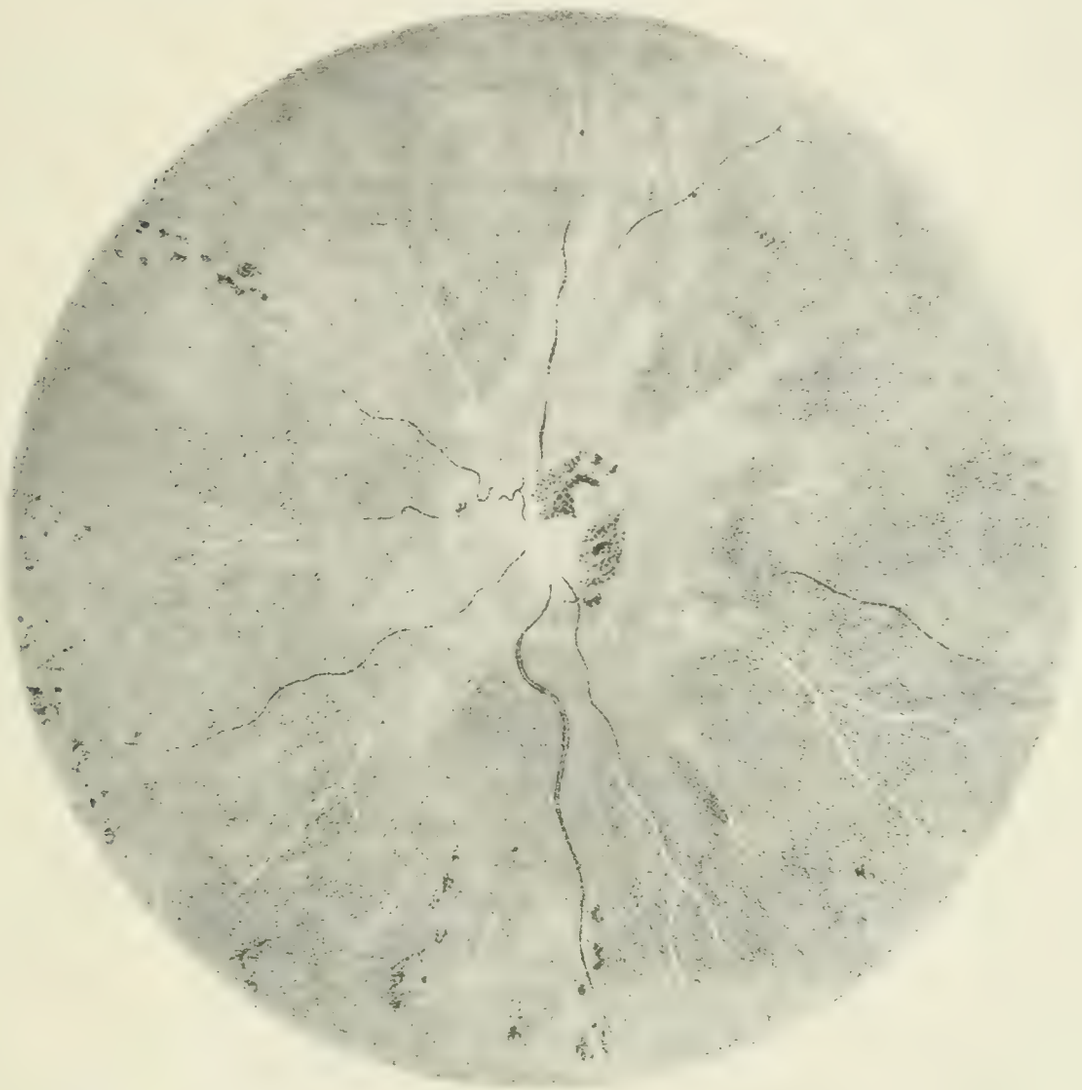
(1) Fehr.—On pigmentation of the optic nerve. (Zur Pigmentierung des Sehnerven.) *Centralbl. f. prak. Augenheilk.*, März, 1909.

(2) Lechner, C. S.—Pigmentatio papillæ. *Nederlandsch Tydschrift voor Geneeskunde*, 1909, p. 797.

(1) The occurrence of pigment on the optic disc as an abnormality is not very rare, but its development at this point, as the result of a pathological process, is very rare, and **Fehr** (Berlin) recounts an interesting case of a boy, aged 13, who fell while playing and drove a pointed stick through the upper eyelid deep into his right orbit. Next morning there was considerable hæmorrhage into the lids and conjunctiva. Through the wound in the upper lid the probe passed deep into the orbit. The globe was somewhat prominent ; there was complete paralysis of the external rectus, limitation of upward movements, and total blindness. The ophthalmoscope showed clear media, but great œdema of the central portions of the retina. The arteries were markedly narrowed, the veins rather full, with interruptions in the blood-column. The diagnosis, therefore, was rupture of the optic nerve, with the central artery, and lesion of the external rectus muscle or sixth nerve.

In the succeeding weeks the œdema of the retina gradually disappeared and numerous small retinal hæmorrhages appeared and in the periphery pigmentary changes arose similar to those described by Wagenmann after division of the ciliary vessels. This pigmentation gradually approached the disc. The disc itself was white and the eye remained blind and in the convergent position. On the 5th July he was discharged. He was seen again on the 11th July and then for the first time a small spot of brownish-black pigment was seen at the temporal edge of the completely atrophic disc, and subsequently, from week to week, this pigmentation could be seen to increase. It consisted of very

fine brownish granules, and the present condition can be seen from the annexed figure, which also shows the retinitis proliferans. The pigmentation of the retina has not advanced any further. The hæmorrhages have become absorbed. The veins have become very small and the arteries transformed into fine white lines.



The question of the origin of the pigment on the disc, in the absence of histological and chemical investigation, cannot be decided with certainty. It is probable that it is of hæmatogenous origin. Its peripheral position on the disc would lead one to assume that its cause is a hæmorrhage in the vaginal space of the optic nerve, whence the blood pigment filtered through into the disc. The other alternative is that the pigment wandered in from the neighbouring retina and choroid, and the ophthalmoscopic appearances would tend to show that this was the case from the spread of the pigmentation, and from the absence of any sign of hæmorrhage either on the disc or on its margins. A. Levy.

(2) Pigmentation of the disc is not an infrequent condition, and it can arise from different sources. It occurs, in the first place, in eyes healthy in all other respects, and we must then consider the condition as a congenital one. In other cases the pigment is transported from other regions of the eye, as, for instance, in choroiditis. Finally, there can be no doubt that pigmentation of the disc can occur from hæmorrhage after trauma of the eye.

G. F. Rochat.

XXII.—SCOPOLAMINE-MORPHINE ANÆSTHESIA.

Stuelp, O.—On the general anæsthesia with scopolamine-morphine in 100 ophthamic operations. Ueber Skopolamin-Morphium Narkosen bei 100 augenärztlichen Operationen.) *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1909.

Stuelp records his experiences with scopolamine-morphine anæsthesia in 100 cases. Like Segelken (see abstract of Segelken's paper in THE OPHTHALMOSCOPE, 1907, p. 736) he used "Skopomorphin" (Riedel) in sterilized glass tubes. The patient takes 0·5 of veronal the night before the operation. Three hours before the commencement of the latter, a third of the solution is injected subcutaneously, one and a half hours later the second third, and, where required, the last third after a further lapse of one hour. Half an hour after the third injection, the operation begins. The effect of the injections is a state intermediate between waking and sleeping, and it appears advantageous not to dispense with the instillation of cocaine or infiltration anæsthesia. Eye movements are carried out as required by the surgeon. The patient's thirst, the result of the drying effect of scopolamine on the mucous membranes, has to be satisfied with mineral water, as it is a disturbing factor. The method proved completely successful in 45 cases, in 26 the effect was incomplete but still useful, whereas in 29 cases the injections failed to send the patient to sleep, sometimes producing even excitation. Yet in these latter cases chloroform anæsthesia is facilitated by the preceding injections, and the method, although far from being ideal, can, therefore, be recommended for all cases except in children under 10 to 12 years. C. MARKUS.

XXIII.—REMEDIES.

(1) Rubert, J.—On the influence adrenalin exerts upon intraocular tension. (Ueber den Einfluss des Adrenalins auf den intraocularen Druck.) *Zeitschritt für Augenheilkunde*, Februar, 1909.

(2) Pick, L.—Some actions of iodine upon the eye. (Ueber Wirkungen des Iod auf das Auge.) *Zeitschrift für Augenheilkunde*, April, 1909.

(3) Igersheimer, J.—Experimental studies of the action of atoxyl on the eye. (Experimentelle Studien über die Wirkung des Atoxyls auf das Auge). *Bericht der Ophthalmologischen Gesellschaft zu Heidelberg*, 1908 (volume published in 1909, p. 242).

(4) Adam.—On a new method of treating adult blennorrhœa. (Über eine neue Behandlungsmethode der Blennorrhœa adultorum.) *Bericht der Ophthalmologischen Gesellschaft, Heidelberg*, 1908, (volume published in 1909, page 291).

(5) Behse, Emil.—Experimental researches on the action of quinine upon the eye. (Experimentelle Untersuchungen über die Einwirkung des Chinins auf das Auge.) von Graefe's *Archiv für Ophthalmologie*, Bd. LXX, 2, April 13, 1909.

(6) **Truc.—A case of oculo-cutaneous leprosy in a non-syphilitic subject cured by intravenous injections of mercury cyanide.** (Un cas de lèpre oculo-cutanée guéri chez un non-syphilitique par des injections intra-veineuses de cyanure de mercure.) *Annales d'Oculistique*, juin, 1909.

(7) **McFarlane, Murray.—The use of adrenalin chloride in special work on the eye, ear, and throat.** *Canadian Practitioner and Review*, June, 1909.

(8) **Key.—The effect of atoxyl on the eye, being a clinical and experimental study.** *University of Pennsylvania Medical Bulletin*, June, 1909.

(9) **Hippel, A. von.—On the therapeutical value of Deutschmann's serum.** (Ueber den therapeutischen Wert von Deutschmann's Serum.) von Graefe's *Archiv für Ophthalmologie*, Bd. LXXII, Heft 2, 26 Oktober, 1909.

(10) **Brav, Aaron.—The treatment of interstitial keratitis.** *Therapeutic Gazette*, October 15th, 1909.

(11) **Rollet.—Large doses of potassium iodide in the treatment of muscular paralyses of the eye.** (Iodure de potassium à haute dose dans les paralysies musculaires de l'œil.) *Bull. de la Société d'Ophtalmologie de Lyon*, 1909, p. 30.

(12) **Angioletta, Dominique.— Paraspecific serum-therapy and sub-conjunctival injections of sodium chloride in ocular infections.** *La Clinique Ophtalmologique*, 10 octobre, 1909.

(1) **Rubert** (Kief).—Ophthalmic surgeons owe a debt of gratitude to the author of this research, which clears away the mists which have obscured our views upon the action of adrenalin on intraocular tension. We can now quite definitely say that to use adrenalin indiscriminately upon the eyes of elderly people is most indiscrete ; to use it in eyes disposed to, or affected with, glaucoma is a mistake, unless the patient is under immediate and constant observation, a mistake which can lead to, and has resulted in, the loss of an eye. Senn has published a case in which he instilled two drops of adrenalin into an eye suffering from absolute hæmorrhagic glaucoma. Such an acute attack supervened that the eye had to be enucleated. MacCallan records five cases of glaucoma in which adrenalin caused exacerbation of all the symptoms. Parsons, Jessop, and Gama Pinto add fresh examples to the list. On the other hand, other authors have found that the compound has exerted a beneficent influence upon glaucoma ; used alone or in combination with myotics it has lowered the tension. Rubert's experiments help us to understand these divergent opinions, both of them absolutely true. Our knowledge of the action of adrenalin upon the eye depends largely upon the classical experiments of Wessely (*Bericht der Ophthalmologischen Gesellschaft, Heidelberg*, 1900, *Zeit. f. Augenheilkunde*, XIII, 4, 1905, *etc.*) After many experiments upon the eyes of animals, he decided that adrenalin dilated the pupil and slightly lowered the tension. The mydriasis was due to a direct stimulation of the dilator pupillæ, the hypotony to the vaso-constrictor action upon the ciliary body. Wessely laid great stress upon the necessity for injecting the reagent subconjunctivally ; simple instillation of a 1 : 1000

solution neither dilated the pupil nor caused any lowering of tension. Wessely made no experiments upon man, but he opined that to obtain any action upon the pupil or tension, it would be necessary to employ almost toxic doses.

Kiljuschiko found that dilute solutions had no action. When a 1 : 1,000 solution was employed, a slight fall in tension was occasionally detected. Timofejen, using an extract of supra-renal bodies, was unable to detect any alteration in tension.

In his own research, Rubert used Parke, Davis & Co.'s *Takamine* (1 : 1,000) undiluted. The tension was determined by taking the mean of several results with Maklakow's tonometer (*Arch. d'Ophtalm.*, No. 5, 892). 34 patients were examined; 13 of them having normal tension, and 21 a raised tension. The adrenalin was employed as single instillations; as instillations repeated every four hours; and subconjunctivally. The results are tabulated into 4 lists, and many of them are graphically expressed in curves.

In a normal patient the first effect of an instillation is a fall in tension. This is succeeded by a rapid rise which persists longer than the fall, and rises above the previous normal. The tension then sinks to normal. In some cases a second fall was noticed.

In a glaucomatous eye there are two varieties of action. Either the adrenalin acts beneficially, causing a decided fall, or it has the opposite action, raising the tension and precipitating an attack of acute glaucoma, which cannot always be controlled by eserine. The primary fall was generally noticed, and this was followed by a rise which either passed into an acute glaucoma, or was replaced by a fall below the original tension.

In one case after the primary fall, after two hours, the tension rose to 60 mm. Hg. above the original tension, with clear signs of an attack of glaucoma. In another case the pain became so violent that the patient "*eigenwillig das Spital verliess.*" What wealth of unconscious humour is contained in that word *eigenwillig*! The patient left the hospital of her own accord, showing more sense that the next two recorded, in which, on account of *agonising pain*, the secondary fall was not waited for!

Experiments were made upon patients with eserine and adrenalin combined. In those in whom adrenalin reduced the tension, the combination exerted a greater influence than eserine alone; but the other group of cases in which adrenalin raised the tension, still experienced a rise of tension whenever adrenalin was added to the myotic.

The author, therefore, is of opinion that adrenalin should never be given to out-patients who are liable to glaucoma, but that it is often of very great service to patients who can be kept under observation.

T. HARRISON BUTLER.

(2) **Pick** (Königsberg).—All preparations of iodine, such as potassium iodide, sodium iodode, iodipin, and sajodin, owe their activity to the iodine they contain. The compounds are decomposed in the tissues, liberating free iodine, which unites with hydrogen to form hydriodic acid and iodic acid, and these compounds unite with albumin forming albuminates of iodine. Not all tissues decompose iodides. For example, the normal brain does not. On the other hand, glands, such as the thyroid, the testes, and the salivary glands, attack them energetically. In the eye iodides act favourably in syphilitic conditions, a fact known to the dresser of a week's standing; they cause an acne on the eyelids, a complication which the dresser learns to recognise in a fortnight. It is unnecessary to abstract the paper further, since all that it contains and more can be culled from any elementary text-book. T. HARRISON BUTLER.

(3) At the present moment no ophthalmic surgeon has the slightest doubt that atoxyl may exert a very unfavourable influence upon the eye. Koch

reported 22 cases of amaurosis in cases of sleeping sickness which had received large doses of atoxyl, and many others have been recorded. In some instances no definite ophthalmoscopic changes are present, but well-marked optic atrophy is generally found, with concentric contraction of the visual field. Nonne has had the opportunity of making a histological examination of the nervous system of a patient who had suffered from atoxyl amaurosis. He found well-marked Marchi-degeneration of the optic nerves, the chiasma, and the optic tracts, with degenerative changes in Goll's columns. The cortex of the cuneus showed no lesions.

Igersheimer, of Heidelberg, has carried out an experimental research upon the effect of large doses of atoxyl upon the eyes of animals; cats, dogs, and rabbits being employed

The first series of experiments referred to the direct action of the drug applied locally to the eye of the rabbit; eleven animals were experimented upon. When 10 per cent. and 20 per cent. solutions were injected into the anterior chamber, no effects were noted. Doses of 0·03 grammes introduced into the vitreous led to severe inflammation, accompanied by hæmorrhages and detachment of the retina. This was caused by massive exudation behind the retina. Sections shewed no alterations in the retina. Larger doses caused a more intense reaction, and sections demonstrated absence of the nerve-fibre layer, degeneration of the ganglion cells, and atrophy of the optic nerves. Smaller doses induced slight degeneration of the ganglion cells and the optic nerve; shewing that, even in small doses, atoxyl has the power of destroying the nervous elements of the retina. Subconjunctival injection of a 20 per cent. solution resulted in true Marchi degeneration of the optic nerve *without* retinal changes. The author finds this anomaly difficult to explain.

In the second series the atoxyl was administered to dogs and cats subcutaneously. In the case of dogs there was for some time no apparent change as the dose was raised from 5 c.g to 10 c.g and ultimately to 20 c.g. Then, suddenly the animal became apathetic, the temperature rose, food was refused, and the animal died. With cats the case was very different. Rapidly a series of nervous symptons appeared, the animal began to move slowly and to stretch like a man who has only finished half his sleep; then, a rapidly increasing ataxy developed, which passed into a spastic stage and ended in spastic paraplegia. Neither in the dogs nor the cats could any ophthalmoscopic changes be detected, and there was apparently no loss of sight. The microscope, however, demonstrated very definite departures from the normal. The medulla of a cat's healthy optic nerve fibre stains yellow to light-brown; here were present many stained an intense black—the so-called "*Marchi-reaction*" of Schreiber (in contradistinction to the *Marchi-degeneration*). Several fibres were found completely degenerated. In collaboration with Herr Itami, the rest of the nervous system of these animals was examined. Severe cell lesions were found in the brain and spinal cord.

Birch-Hirschfeld has carried out similar experiments, and has come to the same conclusion as our author—that atoxyl has a selective deleterious action upon the central nervous system.

In the discussion which followed the reading of the paper, **Dor** stated that he knew of a case of complete optic atrophy resulting from five injections of atoxyl. He thought that it was a drug which no ophthalmologist should use. **v. Krüdener** cited a case of atoxyl amblyopia, and pointed out its cumulative action. **Wolfrum** added two more of complete amaurosis where atoxyl had been administered in the Dermatological Clinic.

The feeling of the Congress was that atoxyl is far too dangerous to be used in the treatment of syphilis. T. HARRISON BUTLER.

(4) **Adam** (Berlin) in cases of blennorrhœa adultorum uses no *lavage*, no

silver salt, and no ice compresses. He simply introduces bleno-lenicet ointment between the lids every two hours. The method is simple, and Adam professed to have obtained excellent results.

In the discussion which followed Adam's communication, **Seefelder** said that they had used the method at Leipzig with most disappointing results. **Meyerhof** had tried the ointment on the acute mucopurulent conjunctivitis which is epidemic in the summer in Egypt. He found it useless.

T. HARRISON BUTLER.

(5) The most important symptom of quinine amblyopia is the altered appearance of the optic disc and its vessels, the first being markedly pale and the vessels more or less contracted. There is some doubt whether these symptoms are due to a specific action of the alkaloid on the vessels or to a general reduction of blood-pressure. In any case the contraction of the walls of the arteries may, as in some of **Behse's** experiments, lead to lesion of the vascular walls, which may proceed to thrombosis. There were also histological changes in the layers of the retina, mostly the ganglionic layer and in the amacrine cells; it remains doubtful whether these are due simply to malnutrition or to specific action of the poison (Birch-Hirschfeld).

R. GRUBER.

(6) **Truc's** patient, a man aged 33, with a good family and personal history, had relapsing kerato-iritis, with formation of yellowish nodules in the cornea and iris, as a result of which the left eye became disorganised and had to be enucleated, while the right was so seriously affected that its vision was reduced to barely 0.2. The ophthalmo-reaction was negative, and injections of tuberculin T.R. did not cause any rise of temperature. Associated with the ocular lesions were reddish-yellow cutaneous *plaques*, with clear spots in them, situated on the brow or the bridge of the nose and behind the left ear, which were diagnosed by a dermatologist to be hydro-adenomata. Although treatment with mercury had previously been tried in vain, both the cutaneous and ocular lesions were completely cured in a few months by a course of 15 intra-venous injections of cyanide of mercury on alternate days, with intramuscular injections of biniodide of mercury and cacodylate of soda on the intervening days. A piece of one of the cutaneous *plaques* was excised, and on examination, was found to contain no spirochætes, but a bacillus which morphologically might be either that of tuberculosis or leprosy, but was shown to be the latter by the negative results of inoculation experiments in guinea-pigs.

Truc considers that the cutaneous lesions were certainly leprous, and that from the analogy between them and the ocular lesions, both in their course and their cure, there can be no doubt that the latter were of a similar nature, while the effect of the intravenous injections on both sets of lesions was undeniable.

R. J. COULTER.

(7) **McFarlane**, of Toronto, discusses the use of adrenalin chloride (Parke, Davis, & Co.) in eye, ear, and throat cases. After describing the well-known effects that follow the dropping of a 1 : 1000 solution into the conjunctival sac, the author speaks of pallor extending to the skin of the cheek, nose, and eyebrow, an observation new to us. In fifty cases of conjunctivitis of all degrees of severity, adrenalin (1 : 5,000) caused blanching of the mucous membrane, but we do not gather that it had any therapeutic effect. The author thinks that the drug is contraindicated in iritis, choroidal disease, and in corneal ulceration. Its employment in cases of glaucoma is mentioned, but not endorsed. In operative work upon the eye, a 1 : 2,000 solution gives the best results, preceded by a drop of 2 per cent. cocaine hydrochloride. In ten cases of strabismus operation and in one case of advancement of the internal rectus

muscle, a couple of drops of a 1 : 1,000 solution of adrenalin rendered the various procedures almost bloodless. McFarlane believes that adrenalin possesses not only a superficial, but also a deep hæmostatic action. In support of this view, he instances an enucleation of the eye where not more than ten drops of blood were lost. In this case, five drops of a 1 : 1000 solution of adrenalin were placed in the conjunctival sac ten minutes prior to chloroform anæsthesia. He states his opinion that in this case the effect of the drug extended to the central artery of the optic nerve. In three cases of cataract extraction adrenalin appeared to be responsible for profuse hæmorrhage from the iris when iridectomy was performed.

SYDNEY STEPHENSON.

(8) **Key's** conclusions are as follows :—

1. Atoxyl no doubt is of distinct therapeutic value, as shown by the clinical results reported.

2. The drug has a treacherous toxin action in the organism, as indicated by experiments and clinical evidence.

3. The most interesting and prominent effect of its toxin action is manifested by the production of amblyopia.

4. Atoxyl amblyopia is the result of optic nerve atrophy, with primary involvement of the retina, though in certain cases central lesions, shown experimentally and apparent clinically, are very suggestive indeed.

(9) **v. Hippel's** paper seems to have been written in answer to Axenfeld's strictures, that greater criticism in publishing results should be exercised, as Deutschmann's experimental foundations had not stood the ordeal of independent test. v. Hippel in producing particulars of 100 cases of ulcus serpens, plastic iritis, and similar affections, maintains that the injection of Deutschmann's serum, which is perfectly harmless, leads in many cases to better results than the older treatment. In 39 cases of ulcus serpens the result was fairly favourable in 20 cases (as compared with only 33 per cent. under the old therapy). In 17 cases the injections had to be combined with paracentesis after Saemisch, and in some cases Hertel's light treatment was tried, the latter seemingly without much benefit. The best results were achieved in plastic iritis, but not in uveitis serosa ; and in tuberculous forms, the injections were perfectly useless in perforating injuries with infection of the vitreous. v. Hippel generally begins with 2 ccm. of Deutschmann's old serum, but increases the dose, if necessary, to 4 or even 6 ccm. He has also tried Deutschmann's new E serum, but failed to find it more efficacious than the older product.

R. GRUBER.

(10) **Brav,** of Philadelphia, writes on the treatment of interstitial keratitis, but has nothing specially new to say. Dionin is considered to be a useful remedy during the entire course of the disease. Mercury, in Brav's opinion, is still *the* remedy of remedies, and should be employed, best by inunction, during the progressive stage of the affection. As to treatment with thyroid gland, recently employed both in America and Great Britain, the author is outspoken enough to say :—"To try thyroids or any other drug" (except mercury) "is, I believe, a means of prolonging the disease." Great importance is attached by Brav to surrounding the patient with the best hygienic conditions. In special circumstances surgical methods, such as paracentesis or iridectomy, hasten recovery. Peritomy is not mentioned in this connection.

SYDNEY STEPHENSON.

(11) **Rollet**, of Lyons, urges the necessity of administering large doses (8 to 10 grammes a day) of potassium iodide in paralysis of the extrinsic muscles of the eyeball. He quotes a successful case. SYDNEY STEPHENSON.

(12) **Angiolella** (Lucera) has employed Behring's serum, either alone or

associated with subconjunctival salt injections, in various cases of ocular infection. In most of these cases the particular organisms engaged were not established. The writer declares that provided the vitreous be not infected —a proviso already put forward by others—Behring's serum has a very beneficial effect, and that if the process be in the initial stage and limited, this treatment may be all that is necessary for a cure. In more advanced cases he has followed on with the subconjunctival injections. None of his cases, which were few in number, however, showed intolerance or serum "accidents." One noteworthy point is that paraspecific serum therapy gives brilliant results as regards relief of the intense pain associated with these infections of the eye. The writer thus confirms the observations of others. The dose appears to be about 1,000 units, repeated up to three or five doses.

ERNEST THOMSON.

BOOK NOTICES.

Bulletin de la Société d'Ophtalmologie de Lyon. Années 1908-1909. Troisième année. Lyon: Association Typographique, 12 Rue de la Barre. 1909.

This modest paper-backed *brochure* of thirty odd pages represents the proceedings of Lyons Ophthalmological Society for 1908-1909. It contains commendably brief accounts of cases, and is not illustrated in any way.

Annual Statistical Report of the Eye Diseases treated at the Ophthalmic Institute of Malta from July 1908, to July, 1909. By C. MANCHÉ, B.A., M.D. Malta: G. Muscat, 48, Strada Mercanti, Valletta, 1909.

Dr. C. Manché, with the help of his father, one time professor of ophthalmology at Malta University, has recently founded an Ophthalmic Institute at Hamran, Malta, and the report now before us represents the first year's working of that institution. The latter is free to the poor of the Islands, while the richer classes are supposed to contribute something towards the maintenance of the hospital. The number of patients, indoor and outdoor attended during the period under review amounted to 1,251. Affections of the conjunctiva accounted for 954 of the cases, while diseases of the eyelids and cornea respectively amounted to 69. Some interesting details are given of an inoperable case of epithelioma, penetrating deeply into the orbit, cured by the local application of potassium chlorate, at first as a saturated solution, and, later, as a ten per cent. ointment. Of the 954 instances of conjunctival disease, trachoma was responsible for 780, or 81 per cent. This scourge appears to be very prevalent among the poor-class Maltese, and to reach the higher classes chiefly through the children being left to the care of affected servants. A case of ecchymosis of the conjunctiva, due to inspersion of the juice of the *ecbalium elaterium*, is mentioned.

SYDNEY STEPHENSON.

Transactions of the Ophthalmological Society of the United Kingdom. Volume XXIX, Fasc. 3, 1909, London: J. and A. Churchill, 7, Great Marlborough Street. Price 4s. net.

The third and last fasciculus of the XXIXth Volume of the *Transactions* of Ophthalmological Society has recently be issued to members. It contains the Bowman Lecture by Mr. E. Nettleship, delivered in June last, as a kind of appendix, with communications and accounts of cases. It is well illustrated. The fasciculus also includes index for Volume XXIX, together with list of members, officers, and rules, and report of Council.

Sight-testing Made Easy. By W. WRIGHT HARDWICKE, M.D. (St. And.), M.R.C.P. (Ed.). London: J. & A. Churchill, 1909, 2/6 net.

It is difficult to understand why this volume of 66 small pages, plotted out into 152 small paragraphs, has been sent for review to THE OPHTHALMOSCOPE, since the rather useful instrument which stands godfather to the journal, does not appear to be mentioned in it. Nor does retinoscopy find a place as a possible method for the correction of refraction. Yet strange to say the author mentions "cyclopegics" and gives details of the strengths of atropin and homatropin to be used, and of the precise method of employment. The word "cyclopegics" appears at least eight times spelt in this somewhat original manner. Test types bearing the name of a London optician occupy some space.

Beyond remarking that we are sorry for anyone who tries to learn sight-testing by the aid of this book, we have not patience to criticise it in much detail. The value of the volume "to the busy practitioner," for whom it is intended, may be gathered from what we have said and from the following quotations:

Par 31.—"The p.p. or 'near point' in the emmetrope, at which objects can be seen by the exercise of accommodation, is 22 cm."

Par 42.—"The higher the hypermetropia the further from the eye is the p.r." No further explanation is given, *et cætera.*

On Irido-cyclitis. (Over Irido-cyclitis.) By J. M. WENTZEL. Thesis for the degree of M.D. Amsterdam, 1908

Wentzel gives a description of the changes found in eyes excised for chronic cyclitis. Special attention is paid to the changes in the pars plana, and the long spindle-shaped formations there to be found. Generally, these are considered to be the product of the shrinking connective tissue on the epithelial lining of the ciliary body. Wentzel was able to prove, however, that the greater part of these formations are new capillary sprouts. After bleaching of the pigment, he could see that in some of them a lumen was visible, and in other cases he found that they communicated with blood-vessels.

G. F. ROCHAT.

On some Recent Experiences in the Treatment of Trachoma by Excision. (Einige neuere Erfahrungen ueber die Behandlung des Trachoms mittels der Exzision.) By Dr. L. BLUMENTHAL, of Riga. **Beiträge zur Augenheilkunde.** Herausgegeben von Prof. Dr. R. DEUTSCHMANN. Heft 73, 1909.

The treatment of trachoma by excision is regarded by Dr. Blumenthal as by far the most effective, and he speaks from the results of more than 4,000 cases on which he has operated in the course of the last fourteen years. The points to

be considered, he remarks, are, first, whether the immediate result is always favourable; secondly, whether the effect is persistent, which is clearly of the highest importance; and, thirdly, whether the operation is productive of harm. In regard to the first question, the author has no hesitation in returning an affirmative answer. He has operated on many cases with immediate success where the disease has lasted many years, and the pannus, which has affected a large part of the cornea, has then completely disappeared, so that emigrants have been able to pass the very rigorous sanitary regulations of England and America. In regard to the second question, the author finds that if no relapse takes place in the course of six months, the case may be regarded as cured. It is to be noted, however, that the papillæ are not to be shaved off too extensively at one sitting. The effects of the operation can be aided by the application of "blue-stone," and especially by the employment of adrenalin drops. Patience on the part of the patient and care on the part of the operator are required. The harmful effects, which are the subjects of the third question, are fortunately very rare, and chiefly consist of ptosis, which may affect the whole or only a part of the lid. This condition is, however, frequently seen as an accompaniment of trachoma in the more severe forms, and it is capable of being cured by an operation. The number of cases of ptosis after the termination of the treatment is only about 1 per cent. It is more liable to occur in children than in adults, especially when deep narcosis has been induced, and it is more likely to happen in recent cases of trachoma than in old cases, where the retrotarsal folds are thickened and indurated. To avoid its occurrence, care should be taken that too much tissue is not removed from the vicinity of the inner canthus. When ptosis unfortunately occurs as a result of the excision, Blumenthal effects its cure by adopting the plan of treatment with carbolised threads, as recommended by Pagenstecher.

HENRY POWER.

Clinical observations on chronic peripheric thinning and marginal bulging of the cornea. By Drs. SISTO VAUDETTI and ERCOLE PASSERA. Turin: Carlo Clausen (Hans Rinck successors), 1909.

Contributo cliinco alla conoscenza dell' assotigliamento cronico periferico e dell' ectasia marginale della cornea. Dottore SISTO VAUDETTI, Assistente Volontario e Dottore ERCOLE PASSERA Capitano Medico del R. Esercito, Assistente Nonerario con duo la vole e con due figure in testo.

This little pamphlet of 28 pages is an extract from the pages of the Italian journal *Ophthalmologica* (Vol. 1, Fas. 2, 1909). It contains an account of two cases observed by the authors of the memoir of an affection to which attention has been particularly directed by Professor Fuchs, of Vienna. In his monograph on pterygium Fuchs describes two special and rare forms of marginal disease of the cornea: 1, keratitis marginalis profunda, which the reader will find to be noticed in his *Text Book of Ophthalmology* (edition 1891, page 203) and which consists in the formation of a yellowish, sickle-shaped infiltration at the margin of the cornea, which usually disappears in a little while without ulceration, leaving a permanent opacity very similar to a gerontoxon; and 2, keratitis marginalis superficialis, which presents a rather superficial ulceration at the margin. This form commences with the formation of a delicate corneal opacity, bounded by the limbus externally, and internally by a raised or thickened border, the breadth of the opacity being a few millimetres. This zone is, as a whole, slightly depressed, and is traversed by very fine vessels proceeding from the limbus. The affection tends slowly to recovery, leaving only a slight grey marginal

opacity, which is sometimes bordered centrally by a zone of deeper whitish opacity. This affection, which Fuchs clearly distinguishes from the ulcus rodens of Mooren, is often complicated by the formation of pseudo-pterygia. He has observed six cases of this disease, in four of which it was bilateral. The pathology of these cases has been published by Fuchs in his work on sclerosis and marginal atrophy of the cornea In this he remarks that in some persons, usually of a certain age, a furrow or groove appears at the margin of the cornea, without any ulcerative process, but associated with the formation of an arcus senilis. In the four cases he describes, the groove was from one-half to one millimeter in width, and varied in its extent around the periphery, in one case entirely surrounding the cornea, sharply defined centrally but towards the periphery rising gently to the sclero-corneal junction, which was much attenuated with many delicate vessels traversing it. Centrally, was a more or less complete arcus senilis, and in two of the cases the central part of the cornea had yielded to the intraocular pressure. Microscopic examination showed that at the bottom of the groove the thickness of the cornea was much reduced. The result of a second examination rendered it probable that the process began with a solution or absorption of the membrane of Bowman, so that the epithelium assumes a conjunctival type, and rests directly on the lamellæ of the cornea. These first breaking down into fine fibres owing to the dissolution of the cementing substance, with an increase of nuclei, become transformed, with diminished volume, into loose connective tissues presenting at some points undulations, and permeated by numerous blood-vessels. This tissue forms the wall and base of the groove and extends peripherally with the limbus as with the more superficial layers of the sclerotic. Fuchs is not disposed to think that the marginal groove is the result of a catarrhal ulcer, but supposes that the process began not at the plane of the central wall of the groove but at the sclero-corneal edge, whence it advances towards the centre, at the same time penetrating inwards to a certain depth. Finally, he thinks that the development of new vessels on the walls and at the bottom of the grove is primary, and that the vessels themselves must, as in analogous morbid processes, exert a solvent influence on the membrane of Bowman and on the subjacent corneal lamellæ, resulting in the atrophy of the tissue and the formation or hollowing-out of the groove. Lastly, he is inclined to attribute this peculiar affection to a degenerative process rather than to an inflammatory or ulcerative one. Fuchs has also observed two cases, one of whom was scarcely thirty-one, of simple marginal attenuation, without grooving but with production of marginal ectasia, and is of opinion that the ectasia is secondary to the first affection. It is important to note the distinction Fuchs makes between his cases of senile marginal thinning, in which the arcus senilis lies immediately within the groove, and the cases of keratitis with groove, described by Schmidt-Rimpler, in which the senile arc is, on the contrary, situated peripherally to the grooving.

The authors then comment upon cases recorded by Lauber, Seefelder, Vicker, Rupprecht, Axenfeld, and others, and proceed to give the details of their own cases, which are too long to be abstracted here, but which are well illustrated by photographs and plates. They terminate their essay with the following remarks :

Both cases evidently belong to those described by the authors above-mentioned. In the first case the thinning of the cornea, with grooving, was clearly visible in the right eye. The furrows affected the upper and lower border, and probably also the lateral margins beneath the pseudo-pterygia, so that the whole periphery of the cornea might be said to be implicated, with

the exception of a slight interruption at the upper and outer part. The thinning was not accompanied by any evident circumscribed marginal ectasia, but when the cornea was still transparent it was evidently ectatic, presenting the appearance of a pellucid staphyloma. This case corresponds therefore with those described by authors in which the marginal ectasia was absent, although the whole cornea bulged forward. In such cases there is no reason to suspect, with Seefelder, that a circumscribed ectasia of the cornea did at one time exist which had passed away. The alteration of the corneal curvature, which was not capable of being measured by the ophthalmometer of Javal, showed, on examination with the keratoscopic disc of Placido, that its radius was considerably greater in the horizontal than in the vertical direction, but alteration in the curvature in the opposite direction—that is, astigmatism against the rule—is of more frequent occurrence. In the second patient, the process was certainly of more recent date. The marginal attenuation of the cornea was not accompanied by appreciable grooving (as occurred in some of the cases cited in the bibliography at the end of the article). Hence, the authors regard it as more appropriate, with Vicker, to entitle the whole process "peripheric attenuation of the cornea," rather than "marginal grooving" or "furrowing," for whilst the formation of a groove or sulcus may be absent, the thinning of the tissues is always present. In this case circumscribed marginal ectasia existed. A well-marked deformation of the curvation of the cornea was noted, and as the peripheral ectasia was situated exactly on the meridian of the greater radius of curvature, astigmatism against the rule was established, with corresponding diminution of the visual powers. Observations made on this patient after the lapse of three and a half years showed no change in the symptoms, which is sufficient evidence of the chronic character and course of the disease.

In both cases the peripheric lesion was edged centrally by a whitish margin or border of tendinous aspect. The yielding of the cornea being situated externally to the whitish border which when examined microscopically resembled not the tissue of a cicatrix, such as follows recovery from a marginal lesion, but that of an arcus senilis, the lamellæ of the cornea presenting fatty degeneration.

Whilst some doubt still exists in regard to the ætiology of the marginal furrowing of the cornea, there is a general agreement amongst observers in regard to the order in which the clinical phenomena make their appearance, and it is now generally admitted that marginal corneal attenuation and furrowing first manifests itself, and that then the cornea, having its resistance diminished, yields, or may yield to intraocular pressure, giving rise to marginal ectasia and high astigmatism. HENRY POWER.

Fifty-seven Varieties of Medical and Ophthalmic Blunders. By GEORGE M. GOULD, M.D. Ithaca, N.Y.: Published by the author. Andrus and Church, Ithaca, N.Y. 1909.

It is by no means easy to know what to say about Dr. George M. Gould's remarkable pamphlet, *Fifty-seven Varieties of Medical and Ophthalmic Blunders*, and perhaps the wisest plan would be to leave it alone.

Gould's contention is that "much of the prevalent disease and suffering of civilization" is of ocular origin, and that this is disregarded by the medical profession, either from ignorance or from something worse. The author, who seems to look upon himself as a voice crying in the wilderness, is evidently labouring under a sense of injustice, and to that extent appears to have lost his balance

of proportion. The pages of his contribution abound in vehement diatribes directed against what he considers wrong in matters medical and ophthalmic. A veritable verbal cataclysm is poured upon the head of the reader. This violence of language tends to prejudice the ordinary mind against Dr. Gould's views, and thereby to weaken rather than to strengthen his case. Yet amid the crudities, oddities, and quiddities of Dr. Gould's curious contribution, there are some points that should give pause to the ophthalmic surgeon. Of these a few may be quoted.—The author maintains (with justice) that symptoms of eye-strain may coincide with the possession of excellent vision. "Even with 20/25 visual acuity," says Gould, "under mydriasis, the worst kind of unsymmetric astigmatism and eye-strain may be present." Our author tells us that "all opticians and hundreds of oculists prescribe glasses without examination of the eye grounds." He is particularly severe upon the equipment possessed by some ophthalmic surgeons, which, truth to tell, might perhaps be bettered. Here is what he has to say on this point.—"The wretched instruments usually found in oculists' offices make it impossible to do expert or exact refraction work. The old Nachet-cases of trial lenses, the miserable trial frames, etc., etc., are a ludicrous disgrace to an inventive people and in an art (not a science !) requiring such superlative skill. Any machine shop, engineer's office, or cobbler's bench, so outfitted, would be sold out in a month. If the plumbers, the watchmakers, pilots, railroad officials, harness makers, etc., did their work as bunglingly as the oculists, civilization would speedily end. The admirers of the ophthalmometer are in a degree justified in their adulation; unfortunately it springs from an unpraisworthy motive."

Gould insists upon the necessity of paralysing accommodation before the diagnosis of ametropia is made. As to the significance of astigmatism, we learn that "except in the offices of a dozen or more oculists the vicious influence of low degrees of astigmatism is utterly unknown." "It is generally absolutely denied." We should be sorry to believe that this was the case in Great Britain; and, indeed, we know that Dr. Gould's sweeping statement is not justified so far as this country is concerned. We should be loath to believe that it can be true in others. The author insists that "retesting is necessary at least every two years, and in many cases more frequently."

The *brochure* is written with conspicuous literary ability, and abounds in striking phrases. "The first duty of the ophthalmic surgeon is to prevent ophthalmic surgery" embodies a truth, although one perhaps not very obvious at first glance. "One cannot refract by machinery" is another of Gould's telling phrases, and so is "refraction is an art, not a science." Text-books of ophthalmology are characterised by Dr. Gould as "those graveyards of buried theories," but when all is said and done, it seems a pity that Dr. Gould's writing is not couched in more temperate language. His verbal fire-works amuse but do not convince, and, indeed, they go far to prejudice the truth of his views, for it must be recognised that there is more than the proverbial grain of wheat among Dr. Gould's plethoric bushel of chaff—or worse.

SYDNEY STEPHENSON.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE ANGLE NOTATION OF CYLINDRICAL LENSES.

To the Editor of THE OPHTHALMOSCOPE.

Sir,

In the present uncertainty about the choice of notations, the following thoughts are offered in the hope that they may be useful.

1. *Selection of upper or lower semicircle.*—So large a number of trial cells possess inferior semi-circles only, so few, if any, a superior cell alone, that inferior arcs are more suited for a universal notation than superior arcs. The "second thought," therefore, of the Ophthalmological Congress at Naples was not so good as its first.

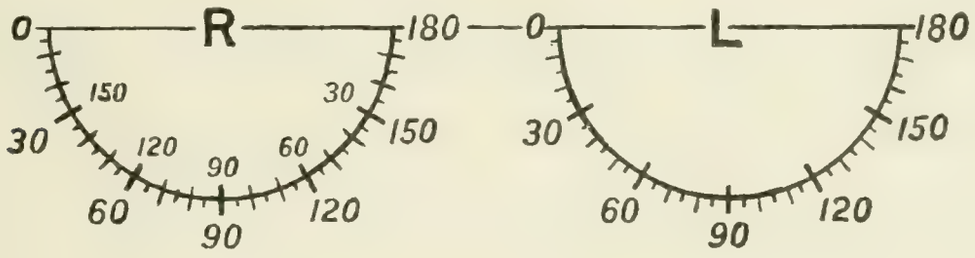
2 *Restriction in choice of notation.*—Of systems in present use, two share the favour of such overwhelming majorities that it would be unwise not to select one of them. These are the standard and the binasal notations. The former is employed by opticians and manufacturers, and is also largely adopted by the ophthalmic surgeons of America, as well as by a few in this country. The latter is made use of in most of the ophthalmic hospitals of Great Britain and by the majority of British ophthalmic surgeons.

3. *The different selections of the Optical Society and the Ophthalmological Congress accounted for.*—The standard notation appeals mostly to students of art, and to those who are of a mechanical turn of mind, since it agrees with mathematical methods and complies with the requirements of mechanical appliances for examining the eyes. The binasal appeals more to students of nature since it is in harmony with physiology. It pays a tribute to the natural symmetry of the human face, and of the eyes themselves. The eyebrows, for example, were they to conform with the standard notation, would have the broad ends of each pointing to the left, and would each taper to the right. Their real symmetry is binasal in common with every other feature of the face. In the eyeballs, too, the optic nerves enter binasally, and the same character of symmetry is observed in the trend of the macular bundles. The retina also complies with binasal symmetry, for though by a special crossing arrangement of the nerves the right half of one retina is linked in the brain with the left half of the other, yet as regards the internal structure of the eyes, the nasal half of one retina agrees anatomically, and I think I might also say pathologically, with the nasal half of the other, thus maintaining so far as the eyeballs themselves are concerned a binasal symmetry. A local disease affecting the nasal side of one retina is more likely to be associated with a similar disease of the nasal side of the other retina than of its temporal side, and the same is true of the two temporal halves. Congenital opacities in the lenses again, betray the same kind of symmetry if they have any at all. We all know, for example, how frequently we find a triangular opacity in the lower and inner part of each lens.

When we come to refraction, and this is much more to the point, any tilting or displacement of the lenses, such as to cause lenticular astigmatism, is far more commonly bilateral than parallel. Similarly, the principal meridians of the corneæ present bilateral symmetry far more often than parallel, so much so indeed that the occurrence of the latter is merely looked upon as a coincidence not more likely to occur than any other form of asymmetry. For example, if one meridian stand at 80° by the binasal notation, the other will in all probability stand at the same. It is not unnatural, therefore, that those

who were physiologically inclined should have hitherto favoured a notation which pays so great a tribute to nature. In conversation, too, and in dictation, it is much easier to speak of both axes at 80° " than to say " the right axis at 100° and the left at 80°."

4. *Advantages of the Standard Notation.*—Though I have hitherto employed the binasal notation only, and admire it for reasons stated above, I am compelled to acknowledge that in practice the standard notation is likely to prove the most useful in the end, for the reasons that mechanical appliances are being multiplied, and that this system lends itself to the



employment of linefans, and charts of similar design, more readily than the binasal. There lies, too, a practical advantage in the immediate entry of the axes of cylinders after the mode most used by manufacturers, so as to escape the errors that are liable to be made by a retail optician during the process of transcribing from one system to another. To minimize the probability of such errors during transcription of the prescriptions of those who still prefer to continue with the binasal notation, I have drawn up a chart which makes the conversion automatic. The outer side of each semi-circle is the one with which the optician is alone concerned, while the inner side contains the binasal, or any other favourite notation of the individual surgeon. The same stroke of the pen which indicates the latter automatically points out the optician's figure. My impression is that the standard notation will eventually be accepted, and the tribute herein paid to its time-honoured competitor is rather to be regarded as an honourable *adieu*, and an explanation of the tenacity of its life, than as a plea for its continuance.

I am, Sir,
Yours faithfully,
ERNEST E. MADDOX.

Glenartney, Poole Road, Bournemouth.
November 8th, 1909.

A SIMPLE SUBSTITUTE FOR A ROTATING PRISM.

To the Editor of The Ophthalmoscope.

Sir,

The controversy of Mr. Liebermann and Mr. Grimsdale in the Ophthalmoscope of October, 1909, and Mr. Liebermann's claim of originality, have recalled to my mind the fact that in the *Ophthalmic Record* of May, 1900, I described a simple method of using an ordinary trial prism as a substitute for a special rotary prism. In my paper I published a diagram by means of which the prism could be marked at its edges, so that the equivalent degrees could be read off without referring to any chart. I also pointed out how the prism thus graduated could be used in conjunction with the Maddox rod

Within the past five or six years I have used this test very seldom, because I have found that all of the diplopia tests are apt to give misleading results. For some years I have placed my chief reliance upon the objective cover test, confirmed, when possible, by the subjective cover test (parallax test of Duane).

Respectfully yours,

F. H. VERHOEFF, M.D.

101, Newbury Street,
Boston, U.S.A.
October 14th, 1909.

A METHOD OF CATARACT EXTRACTION WITH THE RETENTION OF A CORNEAL-CONJUNCTIVAL BRIDGE.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

We have seen in the November number of your journal a note by Dr. N. G. Cluckie on "A method of cataract extraction with the retention of a corneal-conjunctival bridge." We venture to think Dr. Cluckie's proposal not entirely novel. On page 254 of *A Textbook of Ophthalmic Operations*, which was published in the early part of 1907, we wrote as follows.—"A modification of extraction, not without importance, which has received a good deal of attention lately, especially on the Continent, is subconjunctival extraction. . . . . There are several modes in which it is performed; in the most common, the lens is received under a large conjunctival flap, cut during the primary incision, and differing from the usual conjunctival flap only in the fact that it is not separated at its upper limit."

We were unable to trace the origin of this modification, and, therefore, could give no reference, but we claim no originality in the description.

We are, Sir, yours very truly,

HAROLD GRIMSDALE.
ELMORE BREWERTON.

London, W.,
November 11th, 1909.

NOTES AND ECHOES.

Deaths.

THE death is announced of Dr. Xenophon Ch. Scott professor of ophthalmology in the Western Reserve University, Cleveland, U.S.A.

We regret to announce the death of Dr. Natanson, of Moskow.

Mr. Anderson Rodger, a wealthy shipbuilder, and once Provost of Greenock, has died. Some fifteen years ago Mr. Rodger was instrumental in founding the Greenock Eye Infirmary.

* * * *

Appointments.

MR. GEORGE COATS, a communication from whose pen was published in the last number of THE OPHTHALMOSCOPE, has been appointed assistant surgeon to the Royal London Ophthalmic Hospital (Moorfields).

Dr. Arthur J. Ballantyne, a valued correspondent of THE OPHTHALMOSCOPE, has been appointed surgeon to the Glasgow Eye Infirmary, in succession to Dr. T. S. Meighan, whose tragic death occurred on October 15th last

Dr. Hans Lauber has been recognised a *privat-dozent* of ophthalmology in Vienna.

Mr. George H. Pooley has been appointed to the lectureship in ophthalmology in the University of Sheffield.

Dr. A. Freeland Fergus has been appointed lecturer on ophthalmic medicine and surgery at Anderson's College Medical School, Glasgow.

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Honours.

THE Free University of Brussels, in commemoration of its seventy-fifth jubilee, has bestowed the title of doctor upon Prince Karl Theodor, the well-known imperial ophthalmic surgeon of Munich.

Dr. Wendell Reber, of Philadelphia, has been elected president of the American Academy of Ophthalmology and Oto-Laryngology. The selection is sure to be a popular one.

Dr. John Green (junior) has been elected chairman of the Section of Ophthalmology of the Missouri State Medical Association, and Dr. Clarence Loeb, Secretary.

Dr. Ernest Dykes Bower, ophthalmic surgeon to the Gloucester General Infirmary, has been nominated Sheriff of Gloucester.

The title of *Hofrat* has been bestowed upon Professor Emil Grósz, General Secretary of the last International Medical Congress and director of the 1st University Eye Klinik in Budapest.

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Sir Stephen Mackenzie's Will.

THE will of Sir Stephen Mackenzie, who died on September 3rd last, at the age of 64 years, has been proved at £10,181.

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La Clinique Ophtalmologique.

OUR editorial sympathy goes forth to our colleagues who edit that well-known periodical, *La Clinique Ophtalmologique*. An editorial in the "*Lancet*" of October 16th, 1909, commences thus:—"We have received several numbers of a journal entitled *La Clinique Ophtalmologique*, the articles in which are chiefly devoted to therapeutical investigations. Some of them are worthy of special notice," &c. That our great medical journal has now just discovered a continental contemporary of fifteen years' standing is shown by that one word "entitled." It is not so very long ago that the editor-in-chief of *La Clinique*, Dr. Darier, was announced to have departed this life by the *Lancet*. When it was discovered that he was still very much alive, the editorial department of the *Lancet*, with an approach to levity unusual in so grave a journal, offered to repair the blunder by including him in the "Births" columns of their paper.

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Professor Uhthoff.

DR. UHTHOFF, of Breslau, has refused a call to Vienna as successor in the chair of ophthalmology to the late Professor Schnabel.

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French Ophthalmological Society.

THE subject chosen for discussion at the next meeting of the *Société Française d'Ophtalmologie* is the Comparative Value of the different Methods of Lighting. It will be opened by M. Gariel, professor of medical physics in the Paris Faculty of Medicine. Observations upon the subject are invited by M. Gariel, at 6, rue Edouard-Detaille, Paris.

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Alien Immigrants.

FROM time to time there is evidence that the Aliens Act has not become such a dead letter as the man in the street is apt to imagine. The latest case was that of two Russian Jews, Mosche and Misha Fishmann, invited to their son's wedding in this country, but turned back by the stern decree of the Alien Immigration Board, since upon medical inspection the man was found to be affected with trachoma.

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Comparative Ophthalmology.

THE first number has reached us of the *Archiv für Vergleichende Ophthalmologie*, devoted, as implied by its title, to comparative ophthalmology. It will appear every three months. It is edited by Dr. Gustav Freytag, and published by S. Hirzel, of Leipzig. Including in its editorial committee are the names of many widely-known ophthalmologists, including that of Mr. Jessop, of London.

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Illumination and Eyesight.

AT the London Institution recently, an address on "Modern Methods of Illumination" was given by Mr. Leon Gaster, secretary of the Illuminating Engineers Society. Mr. Gaster made special reference to the need for a standard specification, with which lamps of good quality ought to comply, so that the public could be assured that those sold came up to what was marked on them. He dealt with the importance of proper illumination in factories, schools, libraries, and hospitals. It was a matter of more than national importance, he said, for school children to work under proper illumination. He emphasised the importance of keeping the modern sources of light out of the direct range to sight, so as to avoid anything in the nature of a glare. There should be kept in prominence the scientist's maxim: "Light on the object, but not on the eye." The lighting of churches and public buildings should also receive attention, and might be recommended to the study of architects when designing edifices.

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A new Ophthalmological Society.

IT is rumoured that the formation of a Midland Ophthalmological Society is imminent.

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